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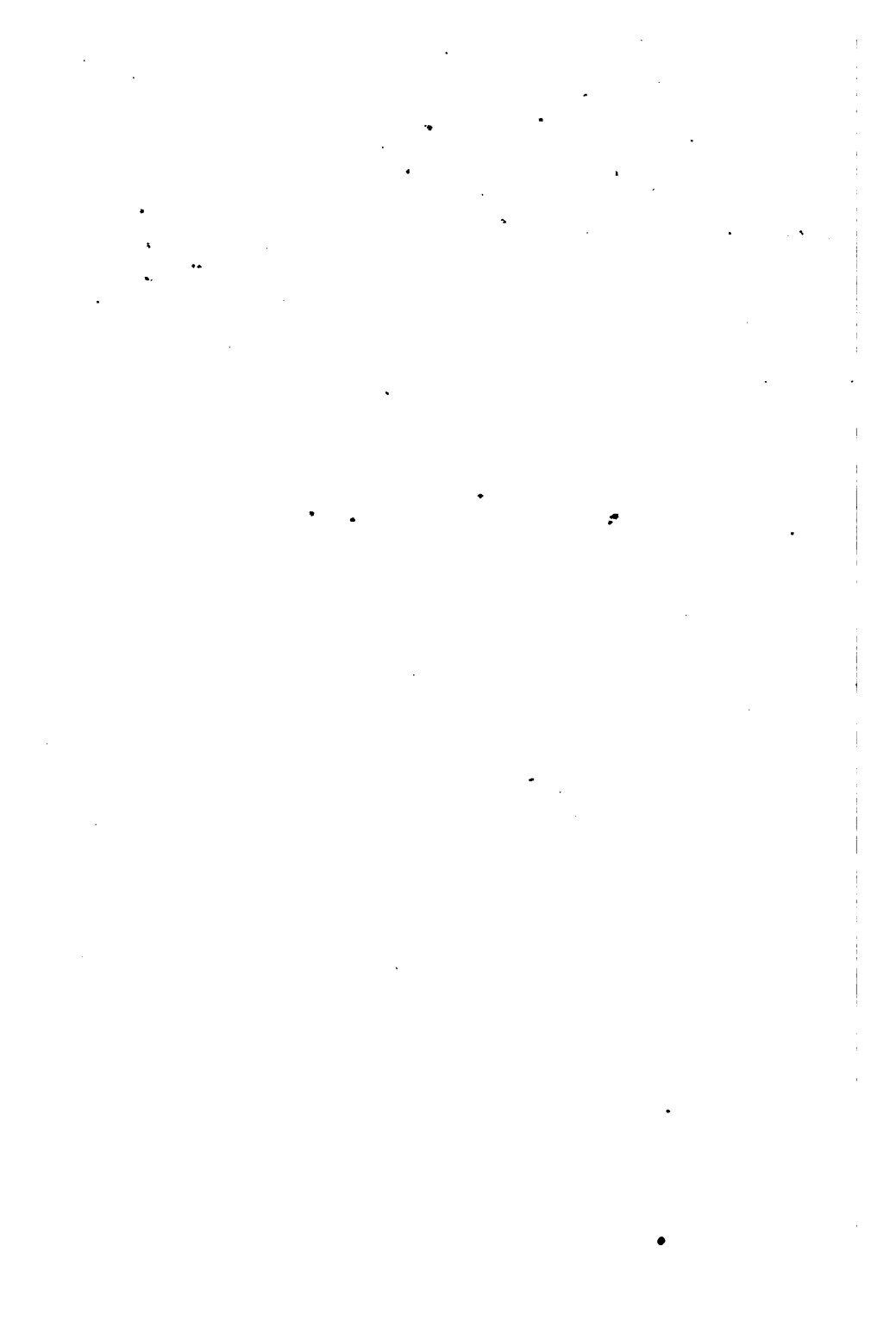
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INDIGESTION, BILIOUSNESS,

AND

GOUT IN ITS PROTEAN ASPECTS

PART II.

Gout in its Protean Aspects.

BY

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"The fathers have eaten sour grapes, and the children's teeth are set on edge."

LONDON

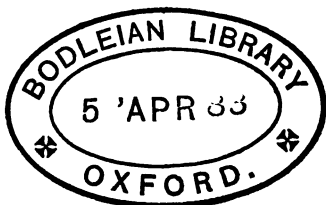
H. K. LEWIS, 186 GOWER STREET
1888

151 n 445.

"Breed is stronger than pasture."—GEORGE ELIOT.

"The little regarded truth that the act of the passing generation is the germ which may and must produce a good or evil fruit in a far distant time."—N. HAWTHORNE.

"There is no disease in which the patient can do so much for himself, or in which the prescriptions of the physician are of so little avail without the full and complete co-operation of the patient, as gout."—R. BENTLEY TODD.



TO

A. BARING GARROD, M.D., F.R.S.

WHOSE RESEARCHES ON GOUT HAVE DONE SO MUCH TO

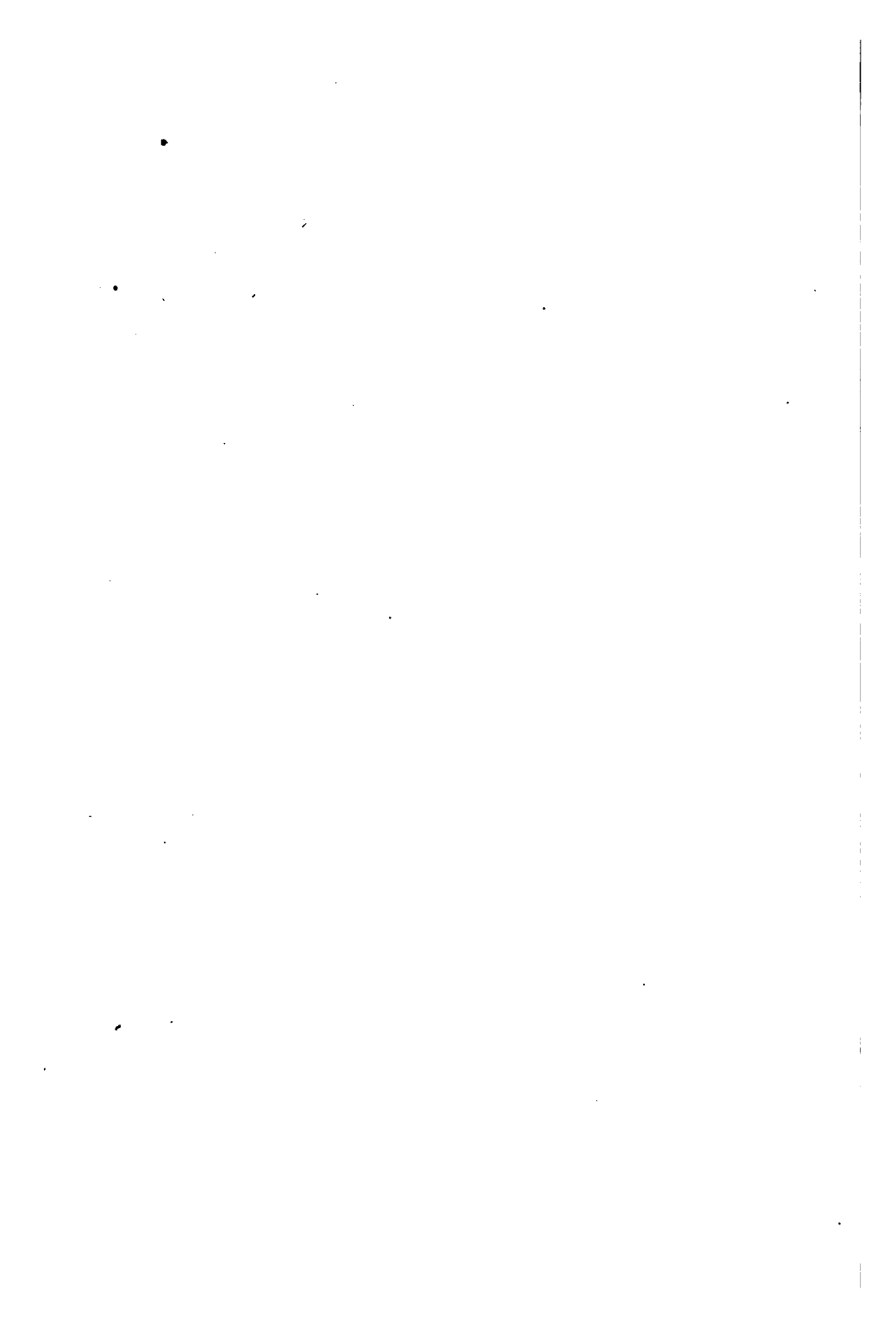
CLEAR UP ITS NATURE AND TREATMENT,

THIS WORK

IS DEDICATED

BY

The Author.



PREFACE.

At first the design of the writer was to produce a compendious work on Gout, bristling with references telling of much research. But the advantages of a shorter treatise, with such quotations from various authorities as will give the reader a broad view of what has been written about Gout, seemed to outweigh those of the primitive design. The success of Part I. placed the publisher on the side of a work of like proportions, viz, a handy volume.

The anomalous, and especially the nervous manifestations of gout have been considered at some length; there being a general consensus of opinion that these forms of gout are on the increase at the present time, as compared with regular articular gout.

The thanks of the Author are again due to Dr. D. G. Johnston, for his aid in revising the proof-sheets.

110 Park Street, Park Lane, W.
February 2nd, 1883.

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GOUT IN ITS PROTEAN ASPECTS.

CHAPTER I.

INTRODUCTORY.

Gout, a term once applied to an affection of the joints, is now used to cover a very wide field of ailments, viz., all the outcomes of a condition of blood laden with gout-poison.

It is not a happy term exactly; and yet no other word conveys so good an impression as to the condition to which it is applied. Lithiasis, or lithæmia are more precise terms for a condition when the blood is laden with uric, or lithic acid, otherwise "gout-poison." Both terms however are new, and carry with them no association of ideas. Gout, on the other hand, is a word which has linked with it a whole train of associated ideas. It suggests good living, indulgence in the pleasures of the palate, which is the well-spring of gout after all is said. The hereditarily gouty who live on an anchorite's fare and then barely escape the grip of their hereditary foe, indignantly deny this statement; nevertheless it is well-founded. If they do not indulge some one did before them. The fathers have eaten sour grapes and the children's teeth are set on edge. If they wish to convince themselves, just let them relax the rigour

of their regimen a little, and await the result. It will soon bring conviction to the most sceptical.

Uric acid, lithic acid, or gout poison, is one of the out-comes of the albuminoid elements of our food; it is a body containing nitrogen. It is found in small quantity as a normal product of the changes, or metabolism which albumen undergoes in the body. Its production in excess leads to gout. This may be due to the consumption of albuminoid food far in excess of the tissue-needs; or it may be due to some impairment of functional activity of the liver in consequence of which uric acid is formed in abnormal amount.

The genesis of gout lies in such causal states. When gout manifests itself in an individual free from all hereditary taint then, usually, it is the result of indulgence on the part of the individual himself. He may fairly credit himself with it, and hold the consolation of "the sweet consciousness of guilt." When it is an hereditary malady its possessor may be personally as innocent of any part in its production, as the heir to a heavily-mortgaged estate is as to his encumbered patrimony. In each case the owner steps into his inheritance; such as it is! He may feel pained about the condition of the family estate; he may feel sorrowful that his liver is an incapable one. But regret is unavailing in either case. There is only one way of remedying the matter. When his property is encumbered he must live economically, and practice self-denying thrift until the estate is once more clear; when he finds his liver an inefficient organ unequal to dealing with any great amount of albuminoids, he must again adjust himself to

the circumstances, must be thrifty, sparing of his food, especially albuminoids; practise a rigorous regimen indeed, or take the alternative consequences. He may feel a sense of unjustness in his lot; but then he must remember that the sins of the fathers are visited upon the children unto the third and fourth generation, and even farther. The self-indulgence of the ancestor must be compensated by a corresponding self-denial in the descendant; the balance can only thus be restored. This is the hard line laid down for us, and we must bow before it. On the other hand the individual may build up gout for his descendants. He may practice great self-indulgence and yet himself escape. But his children will feel the consequences. Just as the hereditarily gouty have gout-poison in their blood; so the *nouveaux riches* can twist a thread of gout throughout their self-acquired possessions. The successful man of lowly origin may make a fortune for his children, and leave them a legacy of gout to boot—whether they are grateful for the latter, or not. This is an unpleasant doctrine, but there is no escape from nature's laws. It is but one more instance of the truth underlying the couplet:

“A dire effect of one of Nature's laws
Unchangeably connected with its cause.”

“It is a monstrous shame!” exclaims the victim of hereditary gout. Well, I cannot help that! The exponent of Nature's laws is not responsible for the facts.

Henry Thomas Buckle held that the unpleasantness of a fact can in no way be regarded as any disproof of the said fact. The father acquires syphilis, and his child is the

victim of hereditary syphilis. It is hard upon the unoffending child. Morally perhaps these hereditary transmissions seem all the harder that they fall unequally: some suffer more than others. Some escape almost if not altogether; others suffer severely. But this is the introduction to a treatise on gout; not an essay on the moral government of the world!

Gout in its protean aspects, then, includes all and every trouble which may be set up by an excess of uric acid in the blood; let the causation of that excess be what it may.

Where the liquor sanguinis flows the uric acid held in solution therein, penetrates with it. Hairs and nails even are not exempt!

In the first part of this work the genesis of uric acid has been given. Here the subject of the outcomes of the presence of uric acid in excess in the blood will be dealt with.

Each moiety is the complement of the other. But the question of production naturally precedes the consideration of the outcomes. Upon our familiarity with the first depends our power of prevention; upon our acquaintance with the latter rests our capacity to alleviate, to palliate, to divert.

There is no form of gout which is free from unpleasantness. Articular gout does not cut short life, indeed is linked, rather, with length of days; but it is a heavy burden of pain and helplessness for the suffering cripple. Gouty disease of the aortic valves causes no inward discomfort until its ravages incapacitate the heart, and then the history is not a long one; the injured organism passes swiftly on through the final stages.

In the latter case no consciousness of what is amiss flashes itself upon the sufferer until distinct progress has been made, and the end is approaching. But probably many persons would prefer the articular form of gout to the deadly internal form which cuts life short with little warning.

In both cases much can be done to retard the progress of the malady, otherwise to keep it at bay. To be able to do this involves two matters. 1. An intimate acquaintance with the natural history of gout in all its manifestations on the part of the medical man, so that he can advise wisely. 2. Unflinching obedience on the part of the patient. If either factor be imperfect the results will be unsatisfactory. Not that the best-laid schemes followed by the most admirable execution will always arrest the progress of the disease; that must be admitted. But in the great bulk of cases it will be found that much, very much may be done by wise measures. If the heir to an encumbered estate pursues the policy of the previous holder, then matters get to that pitch that the property is valueless to him; he might as well be without it. If the victim of congenital gout will not be counselled wisely, ere long existence is barely tolerable—"life is not worth having" is the phrase used. But in either case much may be done by prudence, if that prudence be exercised at a period sufficiently early. First the knowledge, second the resolve; both must be present for the attainment of results—such results as are potentially possible in each case. Some will benefit more than others; let those who do benefit be thankful. Even those who reap no perceptible advantage

would in all probability be measurably worse if they threw their precautions aside.

This preamble is not without its value. It at least fitly introduces the more strictly clinical consideration of the subject.

To put it broadly then, gout is not a mere disease of the joints; it is a term applied to any outcome of the presence of gout-poison in the blood; be the same what it may. Gout-poison is uric, or lithic acid. That has been placed beyond question, or cavil by the observations of Professor Garrod, F.R.S., the well-known authority on the subject. But how comes this formation of gout-poison? the reader asks. In the first Part of this work it was shown that the liver has three functions. (1) The storage of glycogen, or animal starch; (2) The metabolism of albuminoids; and (3) The formation of the bile. This huge and important gland is thus connected with some of our most important maladies.

(1) The storage of glycogen, or animal starch links it with diabetes, or glycosuria; and probably with the excessive formation of lactic acid in rheumatism.

(2) The metabolism of albuminoids connects it with the formation of uric acid, or gout-poison; probably, too, with the production of the peccant matter which leads to arthritis, or rheumatic gout.

(3) The formation of bile by the liver causes this gland to be concerned in jaundice, and in the numerous forms of biliary disturbance so common among us.

With the first and third functions of the liver we are not concerned here; they have been fully considered in

Part I. It is with the second function of the liver, the metabolism, or transformation of albuminoids this work is mainly related.

To review briefly the second function of the liver, it may be said—*

The albuminoid matters of our food, the proteids as they are called, are made soluble in the gastro-intestinal canal, in other words, converted into peptones; as soluble peptones they pass from the digestive canal into the portal vein, and from thence to the liver. Having entered the blood the peptones are transformed again from a soluble into an insoluble form; otherwise the albumen would as readily pass out of the blood-vessels as it passed into them, and so appear in the urine. When peptones are not so transformed this form of albuminuria is set up.

When the albuminoid matters reach the liver a certain portion is elaborated into the albumen of the liquor sanguinis for the nutrition of the tissues. The overplus, or *luxus consumptionis* is converted into the bile-acids (both of which contain nitrogen, while one contains sulphur as a factor in its chemical composition, proving their descent from albuminoids) which are useful in the emulsionising of fat in the small intestines; and also into the waste matters which are cast out by the kidneys (and also by the skin) of which the chief are urea and uric acid. The waste debris of worn-out tissue, and effete blood-corpuscles, is included in this metamorphosis by oxidation. The earlier forms of albuminoid waste are tyrosine, leucine, creatine

* The reader who desires to be familiar with the subject in its details must peruse Part I.

and creatinine: which by further oxidation are converted into uric acid, and ultimately urea. This last is highly soluble, and as such the waste or excess of the nitrogenous element of our food finds its way out of the organism by the water-emunctories of the body, the kidneys and the skin.

The amount of the urea cast out daily is calculated to be 512 grains: of which about 100 grains is eliminated by the skin. (Carpenter).

The amount of uric acid is only a few (about six) grains in health.

But under certain circumstances the normal transformation of these waste nitrogenised bodies is disturbed, and then an excess of uric acid is formed; this is "gout-poison." "Uric acid, like urea, is a normal constituent of urine, and like urea has been found in the blood and in the liver and spleen. In some animals, such as birds and most reptiles, it takes the place of urea. In various diseases the quantity in the urine is increased; and at times, as in gout, uric acid accumulates in the blood, and is deposited in the tissues." (Professor M. Foster). This is a quotation from the "Text-book of Physiology" by this distinguished physiologist. Under certain circumstances uric acid rather than urea is formed and then gout follows; that is, the human liver carries on the metamorphosis or metabolism of albuminoids in a manner normal to animals with solid urinary excrement; and so insoluble uric acid is formed instead of highly soluble urea; this form of nitrogenised waste does not readily escape in the water of the kidneys and skin, but "accumulates in the blood and is

deposited in the tissues :” in other words the individual becomes “gouty,” in the widest sense of the word.

This perversion of the process of the oxidation of albuminoids is the starting point of gout. Let us see what Prof. Foster has to say further—“By oxidation a molecule of uric acid can be split up into two molecules of urea, and a molecule of mesoxalic acid. It may, therefore, be spoken of as a less oxidised form of a proteid metabolite than urea; but there is no evidence whatever to shew that the former is a necessary antecedent of the latter; on the contrary, all the facts go to shew that the appearance of uric acid is the result of a metabolism, slightly diverging from that leading to urea.”

Consequently gout is not merely defective oxidation; for birds breathe rapidly and have a high temperature, yet their urine is solid and consists of uric acid in combination with various bases. The formation of uric acid instead of urea is a perversion of albuminoid metabolism in the liver. It may be induced by long-continued indulgence in albuminoid food until the liver becomes functionally somewhat worn out, and so forms uric acid instead of urea; the normal causation of acquired gout. Or it may be that the liver is congenitally an imperfect one from such excess in the individual's progenitors. Whether acquired or congenital, gout is, at its starting point, a perversion of the second function of the liver by which albuminoid matters in their retrograde metamorphosis are converted too much into uric acid instead of urea. As the soluble urea, the nitrogenised waste passes out of the body by the water-emunctories; as the insoluble uric acid it “accumulates in

the blood, and is deposited in the tissues." This seems to me at least a clear, lucid explanation of the phenomena of gout: as regards its genesis.

Then comes the secondary matter, what are the morbid changes wrought in the various tissues by the deposit or infiltration of uric acid within them? In these we find the protean forms which gout may, and does assume.

As to the relations of gout to uric acid Garrod says—*"The blood in gout is invariably rich in uric acid."* But it is not possible to give the amount of uric acid formed in the body per diem, because it is not cast out regularly but is retained. Indeed, as will be seen in the next chapter, previous to an attack of gout there is but little uric acid in the urine; while the quantity rises as an outbreak of gout occurs and subsides. But this is certain, that while a mere trace only of uric acid is to be found in the blood of healthy persons, "in very chronic gout, the blood even in the interval between the exacerbations, was always discovered to be rich in uric acid." (Garrod).

From this arises a very important question. Granting that uric acid is formed by the liver in excessive quantities in gouty persons, and that such perversion of the function of the liver is the starting point of gout—may gout never arise from some change in the kidneys? In other words, may not some injury to the kidneys be, in certain cases, the point from which actual gout dates?

I am inclined to think such, at times, is the case. One instance is well known to me. The individual is distinctly gouty, yet there is no history of gout in his family by either side. His father and mother each had a large heart,

and hard arteries ; apoplexy by rupture of a vessel overhangs both sides, and his father had rheumatism. No one of his race ever had any joint-thickening before him. He caught a severe attack of scarlet fever, had some cedema after, and albuminuria persisting for some months afterwards. In a year or two he showed gouty symptoms ; then had a severe attack in numerous joints ; after which only great abstemiousness enables him to stave off gout. He is rarely free from some gouty manifestation or other. Now it seems to me that had not this man had the scarlatinal nephritis which injured his kidneys to some extent, he would no more have had distinct gout than had any of his progenitors. Their livers probably formed a good deal of uric acid, but large capable kidneys got rid of it readily. His kidneys were injured by an accidental inflammation, and since then, there is an accumulation of uric acid in the blood, and gouty manifestations.

This leads up to a very important matter.

Gout, or excess of uric acid depends causally upon perversion of the liver in the metabolism of albuminoids ; how is it then that it is regarded as a kidney affection ?

Because in time the kidneys become impaired by the work thrown upon them by this perversion of the liver. Secondary digestion has been described in Part I. as the action of the liver upon the products of primary, or gastrointestinal digestion. When mal-products, of which excess of uric acid is the main, are formed in this secondary digestion, the blood is surcharged with them, and they in time set up kidney changes by the irritation they excite. Consequently in the language of Prof. G. Johnson, F.R.S.,

the well-known authority on the kidney and its diseases—
“*renal degeneration is a consequence of the long-continued elimination of products of faulty digestion through the kidneys.*”

And certainly the usual history of gout is a gradual progression from bad to worse as years go on, with increasing evidences of kidney implication; and after death these organs are found contracted, hard, and often containing crystals of uric acid, not rarely in cysts, formed by the dilatation and subsequent closure of the distal end of a urinary tubule—the small red gouty kidney.

But at times the history is different. A young man with a distinctly gouty family history has a severe paroxysm of gout, and remains free from further attacks for years. Here we must assume, either that there was some acute disturbance of the function of the liver leading to the formation of uric acid in excess; or some acute disturbance of the kidneys by which the exit of the uric acid was hindered. This diminished excretion of uric acid by the kidneys is distinctly related to attacks of gout, and the morbid changes in the kidney, as time goes on, leave the patient more and more the victim of gout. Indeed there are grounds for holding that hereditary gout may involve some congenital impairment of the kidney as to the casting out uric acid; as well as some liver perversion by which an excess of uric acid may be formed. Certainly if both exist then the individual will be liable to accumulations of uric acid in the blood unless the utmost watchfulness be constantly and continuously practised. This person belongs to the class spoken of by Dr. J. Henry Bennett, of Mentone, when he wrote:—“The children of gouty parents ought more especially to follow

the hygienic and dietetic laws laid down in these pages if they wish to escape much suffering. As a rule they ought to be all but water-drinkers throughout life ; they have to pay the penalty of their progenitors' excess or dietetic errors." (*Nutrition in Health and Disease*). The hypothesis may be raised as regards such persons, that any excess of uric acid formed by the liver is sure to tell upon them ; because their kidneys possess little capacity for casting out uric acid. Nor will it be judicial to ignore here defective oxidation as a factor in the production of uric acid. Long continued defective oxidation may lead to the liver forming a less oxidised albuminoid metabolite, uric acid, rather than the more highly oxidised urea. Such probably is the gout of the pallid city man who lives in close rooms where the oxygen of the air is largely used up, and who is improved by a life in the fresh air.

We must then admit that there are three factors present in the production of the gouty state due to gout-poison ; otherwise uric, or lithic acid.

1. Liver impairment by which uric acid is formed in excess.

2. Kidney incapacity to excrete uric acid.

3. Defective oxidation which in time leads to the less oxidised form of albuminoid waste, uric acid, being formed rather than urea.

Such then is a broad view of the genesis of gout. One factor being more pronounced in one case ; another in another case ; while in a third a combination of factors is in action.

Some considerations as to the proper management of gout are suggested by these propositions.

First. Preventative measures, viz., after full growth is attained to limit the amount of albuminoid food taken to the absolute requirement of the tissues; so as to lessen the work of the liver as regards its second function. (Possibly some forms of albuminoids are less liable to undergo perversion in this metabolism, and so are to be preferred in gouty states). The avoidance of irritating matters, as alcohol generally, and certain wines in particular, which act injuriously upon the liver. And the exhibition of certain agents which are stimulants or tonics to the liver, increasing its functional activity.

Second. To render uric acid soluble, so that it may readily pass through the kidneys in solution in the urine.

Thirdly. To increase, or augment the oxidising processes when defective.

By such means, separate or combined, each case of gout must be treated: the peculiarities of individuals being met by appropriate measures.

Such then are the broad principles which will be steadily kept in mind in the subsequent chapters.

A thorough acquaintance with the genesis of gout is essential to the proper understanding of the multitudinous morbid changes wrought in the body by gout-poison: and with them the myriads of symptoms, objective and subjective, found in different gouty beings; which are such that many persons, baffled in their attempt to grasp the subject in its entirety, fall back into a cynical disbelief as to their association with gout-poison; and declare their conviction that the connection exists rather in the imagination of the medical man than in the system of the patient.

CHAPTER II.

THE BLOOD AND URINE IN GOUT.

MANY observers have noted the characters of the urine in gout. This might be expected from its association with stone in the bladder, and deposits in the urinary secretion. But as to observations upon the blood these are almost confined to the work of Dr. Garrod. He made a series of observations by means of blisters applied to gouty individuals, and an examination of the serum effused. He placed this in a small glass with a little acetic acid, and then introduced a few fibres of linen; as the serum dries rhombs of uric acid are deposited along the thread. Under a low power of the microscope (60×60) these crystals can be readily seen, especially by polarized light. This "thread experiment" will demonstrate the presence of uric acid when amounting to $\cdot 025$ of a grain in the 1000 parts of serum. Even so much as $\cdot 175$ grain has been found in serum. By this thread experiment Charcot found uric acid in the subarachnoid fluid of a woman who was the subject of chronic gout.

Garrod sums up his conclusions as follows:—

1. "In the long intervals between the attacks in early cases of gout, no appreciable amount of uric acid was found in the blood."
2. "As patients were recovering from an acute attack of gout, a very marked diminution of uric acid in their blood was observed."

3. "In very chronic gout, the blood, even in the intervals between the exacerbations, was always discovered to be rich in uric acid."

4. In cases where symptoms of irregular gout were manifested without any accompanying joint diseases, uric acid was always present in the blood."

From this it would seem that there is a gradually increasing persistence of uric acid in the blood as gout fastens down upon the individual. At first attacks of acute gout cleanse the blood, like thunder-storms which clear the air; so that as Mead said—"Gout is the cure of gout." For the attack of gout is not the disease, rather is it a cleansing process getting rid of so much uric acid. But in time the presence of uric acid is constant, and then the gout becomes chronic.

As to the urine of gout it may be said that as a rule it is clear, copious, and of varying specific gravity. In some cases it is a dense urine; at other times the specific gravity is low—"The urine is variable, being influenced by many circumstances. In some instances it is in spare quantity, and much concentrated; in others it is abundant and dilute." (Scudamore).

When there are the concomitants of a large heart and hard arteries then the urine is copious, pale, and dilute. When there is not present such a state of high arterial tension, then the urine is less copious and of a high specific gravity, sometimes laden with urates.

When an acute paroxysm of gout is present then the urine becomes dense and charged with lithates. (Scudamore). They are already formed and are merely cast out during the paroxysm—the cleansing process.

Budd writes—"Having already shown that the lithates are not formed by the act of secretion, but merely separated from the blood, the discharge of them in such large quantity in gout (especially during the paroxysm) proves that in this disease the blood must be charged with great excess of them, and further shows that the paroxysm is, in one sense a depurating process." Scudamore thought that commonly a copious dilute urine preceded an acute attack; and that in the attack it became dense with a brick-dust, or pink sediment; sometimes with a pellicle on the surface of the urine on standing. He thought this lateritious sediment was 'entirely dependent on a faulty state of the digestive organs; and upon unhealthy assimilation.' Sometimes the deposit is in the form of the 'cayenne grains' of uric acid, often termed 'gravel.' He held that gouty persons "without any exception" pass sometime or other such gravel, or a pink or brick-dust sediment." Before his day these sediments were known to consist of lithates. Gairdner has seen "the close of gout marked by a very free discharge of phosphates; but the appearance of these phosphates is fitful. Garrod thinks that in chronic gout the urine is pale, copious, and of low specific gravity; the amount of urea remaining much the same as in health, except in extreme cases. In acute gout the urine is scanty, while the amount of uric acid in it is low; then as the attack passes off the amount of uric acid is increased, "forming the so-called critical discharges," and then it falls again.

As to the acidity it also varies. Usually it is pronounced.

This acidity is due to free uric acid or urates, rather than an acid phosphate.

Some remarks of a general character may now be made on the matter of the sediments in the urine. White chalky-looking sediments* usually indicate malassimilation, and are seen from two to four hours after a meal. (Bennett). Pink sediments are distinctly gouty, as Scudamore held, While free uric acid is another form of sediment.

Strumous children pass quantities of free uric acid, which is seen when the urine cools in the characteristic form of "cayenne grains," red angular crystals. The subject is one which greatly needs working out. Pale sediments (lithates) require attention to the digestive organs and the dietary. Pink sediments suggest lithia and potash, and often a little mercurial is useful. When these sediments are seen they show the kidneys are casting out uric acid freely. In pale dilute urine of low specific gravity, the lithates are retained in the blood, or at least in the body.

When urate deposits are freely formed in the joints then the urine is usually free from lithatic sediments.

Then as to the variations in character of the urine. In health the urine varies, being more copious in cold weather, and after draughts of fluids; while free perspiration and abstinence from fluids lessen the bulk. As a rule a pale urine is a urine of low specific gravity (except when it contains sugar); a high coloured urine is one of high density. Then again, when the arterial tension is high the bulk of urine is great: when it falls the specific

* Phosphatic sediments are not found in acid urine; they are distinct from lithate deposits. Gouty urine is acid.

gravity rises. The arterial tension and the specific gravity of the urine stand in inverse proportion to each other. In gout the variations in the urine are often more marked than are those of health. But this may be said—the dense high coloured urine even when small in bulk is essentially the urine of excretion of urinary solids: the pale copious urine giving a less total of solids in the twenty-four hours. When the urine changes from a pale dilute form to that of a smaller bulk with high colour and density, then excretion is certainly going on; whether brought about spontaneously by the natural efforts, or induced by appropriate medicines.

Beyond these characters enumerated above, the urine may contain two substances—albumen, and sugar.

The presence of albumen in the urine of certain cases of gout was recognized by Sir C. Scudamore who states that Dr. Wells in June 1811 “considered the subject of serous urine in a truly elaborate manner” in a paper read before the Society for the Improvement of Medical and Chirurgical knowledge. Scudamore thought albuminuria linked with a nervous temperament. Still he held it was not merely a nervous disturbance. He says—“As a general position, I believe it may with truth be contended, that much of the morbid actions of the kidney, which we find, are derived from some error in the functions of the digestive organs; and hence, probably, the source of the present anomaly.” Nor does he seem to attach any great prognostic import to its presence. It was subsequent to his time that Prout, Bright, and others brought so prominently forward the subject of albuminuria. Since then the tendency has been to make the presence, or absence of

albumen the test of the presence, or absence of renal disease. The simplicity of the test rendered it acceptable to many minds, and it holds its ground yet, despite the many attacks made upon it. But as regards gout and gouty changes in the kidneys, albuminuria is of comparatively little moment. Its absence is no comfort in the face of certain groups and congeries of symptoms. Its presence is significant when the heart is failing, and venous congestion of the kidneys is becoming pronounced. It is the measure, then, of venous fulness. It comes and goes with the varying conditions of the circulation; after a while it becomes ever present. But it is the associate of the vascular changes rather than the gout itself. Under other circumstances it is easier to detect its presence than to say to what it is due; or what relation it bears to the gouty condition. It is not the common associate of gout; nor is it usually found with the gouty kidney. Indeed it is not ranked as a symptom of gout. Garrod writes—"Sometimes a very distinct trace of albumen is present in the urine in acute gout; the phenomenon is not at all common in the early attacks, but as the disease assumes a chronic condition, and especially when deposits of urate of soda are seen, some traces of albumen are frequently present during the fit, although in the intervals there may not be the slightest evidence of this substance." Thus it seems that albuminuria is no associate of gout except that it is found as a part of the general disturbance in acute gouty attacks. Gout is found along with a large heart and a tense artery, a condition recognised as one form of chronic Bright's disease. So far from albuminuria being

an essential factor in the diagnosis of this disease an able essay has recently appeared from the pen of Dr. F. A. Mahomed, entitled "*Chronic Bright's Disease without Albuminuria*," which is well worthy of perusal by all. He points out, from cases observed in Guy's Hospital, that in cases where there is a large heart and tight arteries, with gout, or apoplexy, or other associate lesion, albumen is no essential feature; is commonly absent, or may be fitful or transient in appearances, or disappear, while the case gets worse. In fact when albumen shows itself in the urine we do not always know to what it is due, or what is its significance. Nor are we to assume that there is no kidney change going on because it is not present. The subject has been fully discussed in Part I. pp. 219-225, and to this the reader must refer. Soluble albumen (peptone) may not be properly acted upon by the liver, and so appears in the renal secretion: and albuminuria may be, and often is rather the outcome of disturbance of digestion than the evidence of kidney disease; especially in that form connected with gout, the small red, cirrhotic, contracted, or gouty kidney as it is variously termed. Indeed, in brief, albuminuria is no concomitant of gout, and can not be regarded as belonging to it—except in an incidental way.

The presence of sugar in the urine of the gouty is a clinical matter on which we need much more information than we possess at present. The comparative freedom from gravity of sugar in the urine of corpulent persons is generally recognised. Roberts says—"It is a curious circumstance that diabetes in corpulent persons is very markedly less formidable than in those of spare habit." He also recog-

nises a mild form of glycosuria as often found with "gout." Garrod has observed a relation between gout and diabetes. He writes,—“In several instances of patients who had for many years been the subjects of periodic gouty attacks, the supervention of diabetes has entirely prevented its occurrence: and in others it has lengthened the intervals very considerably. In cases in which gout has continued there has been usually an absence of any great augmentation of the urinary secretion, although it may have been highly impregnated with sugar, and in such cases the uric acid may not have been completely thrown out.” Then again he writes—“I have known several instances of patients previously suffering from gravel and calculi, who have lost all traces of these ailments on the supervention of diabetes; another change of a lesser for a greater evil.” That glycosuria should be found with uric acid is what seems probable when we reflect upon the functions of the liver, which deals with the storage of glycogen as well as the metabolism of albuminoids. But in stout or corpulent persons the loss of sugar is of little moment, unless its constant presence in the kidneys leads to disease in them—a matter not yet proved. Their nutrition is not impaired in these stout diabetics, nor does their health apparently suffer; and the escape of sugar seems rather a “waste-pipe” affair than anything else. If the sugar did not so escape what would become of it? It would probably be deposited as fat, and thus cause them to be even more corpulent. Some healthy vigorous men of the gouty diathesis, pass sugar continuously for years, without any apparent impairment of the health; indeed they are capable of great toil, mental

and bodily, beyond their fellows. This subject is one which will repay any honest worker to thoroughly investigate; and the conclusions arrived at by him will be very valuable clinically. On the other hand it is a matter of personal observation that the appearance of sugar in the urine of old gouty subjects is of the worst and gravest significance. It seems that at last the liver becomes, so functionally worn out that it cannot dehydrate the sugar of the portal vein into glycogen; and then the sugar thus remaining in the blood finds its way into the urinary secretion. In such cases there is also a concomitant wasting, commensurate with the loss of the sugar. The significance of wasting in elderly persons is generally recognised. It would seem that this wasting is at times related to a "sugar-drain" in the urine. This aspect of the relation of glycosuria to gout will also well reward any investigator who may take it up.

While albuminuria has no definite relations to gout, it would seem that such is not the case with glycosuria; whether it belongs to the harmless forms seen in stout persons, or to the other form which ushers in the final stages of wasting in old gouty persons. Glycosuria, and the formation of uric acid are alike the outcome of a liver functionally impaired. In some cases the association is free from omen, in others it is grimly significant.

There was a day, not long past, when the urine was methodically examined with the greatest assiduity, and its varying factors laboriously computed. It was found, however, that such minute analyses threw little light upon the cause of the patient's malady, and were even of less service in pointing to any line of treatment, or regimen which would

exercise any beneficial effect. If there be an excess of urates, or urea, then it is well to diet the patient. Oxalic acid is a perversion of metabolism, when produced in any quantity and persistingly. But its significance again depends upon the conditions with which it is associated. Roberts says—"at the most, oxaluria is only one in a long list of symptoms, and one of the least significant"—and further he writes "oxaluria does not, in the opinion of the present writer, furnish special indications for treatment." The same writer says—"There is not the least reason to believe that there is any constitutional state specially characterised by any excessive secretion of phosphates."

The reader must not run away with the impression that these remarks are intended to inculcate neglect of examination of the urine. Far from it! The lesson which they are designed to teach is this—that the detection of the presence in considerable quantity of substances either normal to the urine, or at times found in it without any disturbance of the general health, is sterile as to results; unless the disturbances of digestion which give rise to them can be affected by the line of treatment adopted. It is the perversions of normal processes which we must grasp in order to be of service to the patient. In so far as analyses of the urine will help us to do this they are useful; beyond this, the examination of the urine serves merely to occupy the time of the medical man and amuse the patient. It is not the finding of the substances, but the cause of their presence which is the vital matter. If the one leads to the other it is well; if it do not then it is useless—except in so far as it gratifies doctor and patient and indicates "pains-

taking." Indeed there are some grounds for believing that minute analysis of the urine is not always the evidence of scientific interest in a case, but rather serves the moral or immoral end, as the case may be, of "impressing the patient." Variations in the "output" of the kidneys, like variations in the "output" of a mine are instructive, or not, according to the knowledge and earnestness of the observer.

Connected closely with this matter if not just belonging to it, is the question of the excretion of uric acid by the skin in the gouty. Of old it was thought that uric acid was readily given off by the skin; but Garrod calls this in question. He found only oxalate of lime and urea, in the sweat, even in cases where blister-serum was rich in uric acid. I had a patient recently who worked a great deal with the microscope, and who made sections of his own sudoriparous glands in which he found crystals of uric acid lining the sweat tube. Crystals of urate of soda have been found in the dried serum of eczematous vesicles in gout; but sweat is not serum.

Sweat is a secretion not an exudation.

CHAPTER III.

THE PATHOLOGICAL CHANGES WROUGHT BY GOUT.

(EXTERNAL MANIFESTATIONS).

THE most marked feature of gout is the characteristic changes it produces in the joints; especially those of the hands and feet. The Greeks called it "podagra" foot-seizure, and "cheiragra" hand-seizure, from its affection for the joints of the extremities.

Gout is derived from "Goutte," the French of the Latin "gutta" a drop, "because it was believed to be produced by a liquid which distilled, *goutte à goutte*, 'drop by drop' on the diseased part. This name which seems to have been first used about the year 1270, has been admitted into the different languages of Europe" (Dunglison). The exceeding appropriateness of the term explains easily its general adoption: for the poison is deposited *goutte à goutte* into the different tissues which form its seat.

Thus Garrod tells us "that many persons experience extremely slight attacks of gout before the development of the affection in an acute form, and several of my patients have assured me that for years before their first severe attack in the great toe, they have felt slight periodical twinges. I am of opinion that when such twinges occur, deposition has already taken place." To illustrate this he gives an engraving showing a minute deposit of urate of soda on the surface of a joint. It consists of "a

speck of urate of soda on the cup of the phalanx of the great toe; found in a man who died of delirium tremens."

Constantly we can understand how, when there is uric acid constantly present in the blood, it is, often very slowly, deposited in its favourite seats, until deformity results, with impaired power of motion. Sometimes the accumulation of urate of soda is very great, forming tuberosities at the joints: especially is this the case at the elbow, as Sydenham observed. This, Scudamore thinks, is connected with the bursa of the joint. The hand is often rendered useless by the progress of the disease: while in other cases great motility remains, even when the deposits are large and numerous. The same is the case with the feet. The deformity, and the abolition of movement are not in proportion to each other. The knee may be thickened and stiff: or its utility as a joint be impaired by mischief in the articulating surfaces, especially in persons of the strumous diathesis. Scudamore thought that gout in the ligament of the patella gave rise to "a peculiar lameness, so that the patient can scarcely make the least extension of the limb without insupportable pain." The hip and shoulder are less liable to be affected by gout, though they are the common seat of rheumatic gout.

Sydenham has compared the fingers to "a bunch of parsnips" when affected by chronic gout. Sometimes the terminal joints of the fingers are the main seat of the disease; and at times the last joint of the index-finger is the sole seat of gout; a small lesion may be, but sorely disabling the individual. The thumb is rarely affected in comparison with the fingers; and when it is affected, it

is the proximal end, or articulation of the meta-carpal bone with the trapezium of the wrist which suffers. The knuckles are often thickened, especially those of the fore and middle-finger by deposits of urate of soda; and a story is told of an old gentleman who scored his game at which he was playing (cribbage) with a "chalk-stone" protruding from his knuckle. Such stony concretions have been designated "crab's-eyes:" and may sometimes be picked out with a needle.

In the feet the metatarsal articulation of the great toe is the favourite locality of gout: indeed of all parts of the body the ball of the great toe is the most marked seat of gout. Various explanations are offered for this. The main reason seems not that it is at the base of the body, where a deposit is likely to occur, so much as that the weight of the body is largely thrown upon it. Thus the heavy butler carrying weights, leaning forward to place dishes on the table, rarely escapes having the great toe implicated when gouty; while the coachman is often worst crippled in his hands which hold the reins. Spicules of uric acid are commonly found in the articular surfaces of the great toe in cases where the attacks of gout have been few and slight. At first the outward change is that of slight thickening or prominence of the joint. Or the bursa is enlarged. Then the amount of deposit increases as urates infiltrate the joint and its ligaments, until all mobility is abolished. In many cases of severe and protracted gout, deposits of chalky matter (urate of soda) occur around and within the joints, and upon the surface of their fibrous tissues; the synovial fluid becomes thick, now and then

even of the consistence of putty, the joints are either partially or completely ankylosed by the rigidity of the surrounding ligaments, and some of the smaller ones, especially the great toe, occasionally so completely surrounded with deposits as to exhibit the appearance of being inclosed in a chalky case" (Garrod). The same authority thinks it is the cartilage rather than the bone itself in which the urates are deposited. Then the instep may be affected: and in some cases it is the articulation of the os calcis which is mainly involved; and then any pressure upon the heel is very painful. The articulations of the knee, and less frequently the elbow, are in other cases the seat of uric acid deposits. But the joints are not the sole seat of gout. Budd writes: "We have described gout as affecting chiefly the structure of joints: they are indeed its most common seat; but many other parts, including some of the viscera, are subject to its morbid action. Of external parts, almost all are composed of fibrous tissue and liable to gouty inflammation: we may particularize aponeuroses of muscles; the sclerotica; cartilages of the nose, eyelids, and ears; ligaments other than those of joints; the periosteum and probably the tunica albuginea of the testicles." Hilton has described the heart as a joint, and gouty inflammation of the valves of the heart (especially the aortic valve) is well-known (Wardrop). One seat of gout is the aponeuroses of the muscles running into the tendo achilles, and those who have suffered therefrom know well how painful is gout when so located. The tendon itself may become so affected as to snap on effort. Probably this seat of gout is almost confined to weighty individuals. Mr. H. Johnson

in speaking of the common accident, rupture of the tendo achilles, writes: "Almost all the cases that have occurred to me were in persons of a gouty habit."

Another seat of gout has been pointed out by Sir James Paget, and that is the palmar surface of the hand, the flexor tendons of the fingers. The ring finger is commonly drawn down by contraction, and the tendons being fixed by gouty inflammation, the finger cannot be straightened. The individual will scoff at the suggestion of gout and explain it is the action of his stick, or umbrella handle; or that he holds his geological specimens in that hand (the left) when he uses his hammer. But a like condition will be found on the other hand; only not so pronounced.

Otolites, the deposits of urate of soda on the cartilage of the ear, are commonly seen. They are pathognomonic of gout. But sometimes the ear has suffered from frost-bite, and there are white specks of cartilage showing which may be mistaken for "chalk;" just as injury to the palm may cause a finger to be drawn down: careful observation will, however, eliminate these sources of error in diagnosis.

At this point it may not be out of place to say a word or two as to gout-deposits being located on the extremities, and the ear-cartilages.

Some time ago a medical man the subject of gout, when consulting me about himself, asked me if ever I had thought of the *why* of gout deposits in the fingers and toes (Crotchley Clapham). My answer was that so far no solution had presented itself to my mind. He then suggested that the extremities were more exposed than other parts, and consequently were of lower temperature. In other

words the joints of the hands and feet were often "chilled below the deposit temperature of lithates;" using the analogy of the deposit of urates in the urine on cooling; and their appearance, especially after a frosty night, in the chamber utensil in cold weather, as compared to warmer weather. This view recommends itself as carrying with it an *a priori* probability, as well as distinct clinical associations. Further, Garrod says of otolites:—"The presence of deposits in the ears deserves attention, as it may prove of considerable service in the diagnosis of doubtful cases; I would observe that when I have failed to find them in the ears of men when present elsewhere in the body, it has been in individuals in whom the organs were unusually warm." Warmth to gouty joints, and a bit of flannel sewn into the ordinary garment over an affected articulation, are thus seen to be desirable from a scientific standpoint; as well as that of the patients' sensations—from which the utility of warmth has long been well-known.

Exposure to cold then is a common cause of the locality of gout-deposits. Strain on joints is another cause, as the butler's great-toe. Injuries to the knuckles and the proximal end of the thumb, also lead to gout-deposits. Sometimes an accidental injury clearly precedes the settling down of gout upon the affected part.

Gouty joints may go on to suppuration, especially when subjected to injury. A large discharge may follow in which chalky matter may be readily detected by the eye; even pieces like scraps of eggshell may come away in the suppurating process. By such means the gouty formation may be largely reduced. The skin may then heal over,

and the patient may once more have the use of the limb. At other times an injury may start up gouty inflammation in a joint, where gout had hitherto been unsuspected in the patient. Anchylosis may result from gouty inflammation. At other times repeated attacks pass over the joint without much effect on its motility. The following quotation from Mr. James Moore (*Med. Chir. Trans.*, Vol. I.) is interesting as bearing on the matter—"When a violent fit of gout attacks a chalky tumour the appearance is frequently very alarming, the new paroxysm being accompanied with a fresh serous and chalky effusion, which, added to the old deposit of chalk, occasions a prodigious swelling; the cutis when distended to the utmost, opens; yet sometimes the cuticle remains entire. The chalky or serous fluid may then be seen through the semi-transparent epidermis. The surrounding integuments appear of a deep red or purple hue, threatening mortification, while the pain is excruciating. At length the cuticle gives way, a discharge of serum and chalk takes place, and a remission of all the symptoms usually follows. During the whole of this alarming process, suppuration never occurs; but soon after the opening has taken place suppuration commences, and chalk and pus are then discharged from the ulcer. When an opening is formed, the whole of the chalk never escapes, and its complete (?) evacuation is usually a very tedious process. This is owing to its being diffused through the cellular membrane, as in the cells of a sponge. One cell must sometime give way after another, and small portions of chalk are successively thrown out, so that months and even years pass away before the whole is discharged. It also

frequently happens that the orifice contracts and closes over, leaving portions of chalk underneath. This kind of cicatrix sometimes stands its ground, but, more commonly breaks out again and again to discharge chalk. Even openings into joints which are so dangerous when occasioned by other extraneous bodies, are often attended with no serious symptoms when the joint is filled with chalk." It will happen that such cases will come before the private practitioner at times and prove very trying, in more ways than one. It will therefore be a comfort to him to know that this quotation is made by Wm. Budd in the article Gout in the Library of Medicine. My own opportunities of watching such cases of the external discharge of a chalky tumour have not been sufficiently numerous to warrant my giving it without the support of such corroborative testimony.

The colour of joints containing chalk varies. Sometimes the skin is red, especially when any acute condition is threatening; in other cases it is white. Sometimes the surface is comparatively round and smooth, mostly in stout subjects; at other times the skin is tightly drawn over the deposit so as to follow its irregular outline, and this is most common in lean persons. In some cases the chalk actually protrudes from the surface; at other times the skin at projecting points is very thin and transparent. The joint will often go with the ear.

'The ear, too, presents certain changes worthy of note. In the florid it is usually of a deep red colour, with a large glistening lobe, like a ripe fig. As years go on the bright red hue may fade, but the characteristic ear remains. In

the spare the ear is pale and wrinkled, the lobe looking withered.' In comparatively young subjects of gout, or those in whose future gout is beginning to loom up pretty distinctly, the tense red ear-lobe is often most suggestive. Usually such persons are well nourished and of broad frame, with a large ear lobe. As time goes on both the high colour and the tension, which causes the skin to glisten, pass away to some extent; but the ear-lobe is still fleshy, even if the skin over it be somewhat wrinkled.

'Then the hair is very significant. Fine hair usually falls from the vertex, leaving a bald crown. Thick strong hair does not fall but remains thick, and is white comparatively early. Iron grey hair is very suggestive of lithiasis; and in the dead-house of Vienna, diseased kidneys were invariably found where occasional white hairs were scattered here and there amidst perfectly unchanged black hairs. These persons had not died from kidney diseases, nor was there any suspicion of kidney implication in life. These isolated perfectly white hairs in a dark head are usually found with other evidences of the early stage of the gouty heart; but a long series of years may elapse before the condition becomes very pronounced.' This length of time it is which forms a stumbling-block to some minds. Because the early indications are not swiftly followed by well-marked symptoms the imagination seems to be unable to bridge the gap. The unfolding bud, and full blown flower do not always present such resemblance as would connect the one with the other, to a superficial mind; but knowledge based on experience can enable the close observer to detect in the one a something which will be unmistakable in the other—

but then the bud must have time to develop into the mature flower. So it is in a chronic malady like gout, the trained eye learns to note early indications long antecedent to well-marked manifestations, which the untrained eye cannot detect; or if it sees the outward sign is incapable of appraising it. The experience of one person gained by long years of observation and thought cannot be transferred like a photograph to another mind; the eye can only see what it has learned to see, or in other words, can only see what it carries with it the power to see. One man can see clearly enough what another cannot see, probably because he has not learnt to see it. The value of a study of a chronic disease, is that such labour endows the observer to see it long before it is apparent to the casual observer. More especially does this remark apply to that order of mind which will see nothing until it is no longer possible to avoid seeing it; then it only, reluctantly, admits it. Early greyness has, broadly considered, a decided association with coming gout; and should put the watchful observer on the alert as to the general condition of the patient. But as many persons strongly object to being thought gouty, as if this was a matter involving moral blameworthiness, it is well to make a note without spoken observation. The odd white hair, too, in a black head may be but the *avant courier* of coming whiteness; like the solitary snow-flake borne by a northern blast in a winter's day, which precedes the snow-storm that arrives some hours later. Thick, coarse, and still more crisp hair will often become grey early: and with this change come, usually, some or other of the other manifestations of gout.

The teeth are often very significant. Laycock gives as part of the physiognomy of persons of "the Sanguine Anthritic Diathesis"—"Blood vessels numerous; skin over malar bones highly vascular, giving a floridness to the complexion. Skin fair, firm, oleaginous, perspirable; eyes blue; hair thick, not falling easily; teeth massive, well enamelled, regular, even, undecayed in advanced life." The teeth are large and solid in most instances, and the lower jaw massive: though at times the teeth are small. But whether small, or large they are not usually affected with caries; they become blunt and worn down in time and present a very characteristic appearance. Probably the wearing down is largely due to the acid saliva found in the subjects of lithiasis. The expression "gouty teeth" being used by me at the Harveian Society, Dr. W. Stewart, at a subsequent meeting in April, 1878, "exhibited casts of the teeth from eleven gouty patients. The patients were not selected for their teeth, but for their gout. They were all solid thick teeth, worn down at their free edges. In all cases there was a family history of gout. There was a generic resemblance which was unmistakable. Mr. Henry Sewill said that, as a dentist, his attention had been drawn to the teeth of the gouty; he should not say they were pathognomonic, but they were sufficiently marked to form an aid in diagnosis." (Minutes of the Harveian Society). In some persons with large jaws the teeth are quite massive and very solidly enamelled. The form of the teeth often furnishes a useful clue in diagnosis." (The Heart and its Diseases with their Treatment; including the Gouty Heart, 2nd edit., 1879). Since writing this work further obser-

vation only corroborates what was then written. It is well to make a note of the teeth in looking at any patient.

Just as in the strumous the teeth are thinly enamelled and liable to caries, so in the gouty they are of a different order. The strumous, however, may become the subjects of gout. One of my friends had these massive gouty teeth. In reply to repeated inquiries as to gout coming, he used to laugh scornfully, but good-naturedly. At last disease of the aortic valves (the common seat of gout) came on, and proved the accuracy of the observation. It was the acute mind of the late Professor Laycock which noted the association of changes in the ear, teeth, and hair with gout.

Then again the nails are the subjects of gouty change. Just as in many persons the nails are marked in any acute disease, their formation being impaired by the malady; so an attack of gout will brand its date on the nails of some persons in the form of a transverse marking. As the nail grows and moves along the nail-bed, the date of the acute gouty manifestation is carried with it. Some nails are more affected than others. In one well marked case of this gouty affection of the nails, the thumb, the index finger, and the ring finger were most affected; though the long and little fingers are not exempt therefrom. In less marked instances the nails are altered in their appearance. Instead of a smooth clean surface, there is a roughness, and on examination the individual hairs of which the nail is composed, can be made out. In the normal nail the hairs are so agglutinated together that it is not easy to conceive of the nail being an agglomeration of hairs welded together. But in the gouty, the hairs may be detected in

the structure of the nail passing from the root to the free edge. Such nails are brittle, and no amount of care can keep them neat. Scudamore observes—"In several persons who have gouty concretions within the hands and feet, I have found a remarkable state of hardness of the nails of the toes and fingers, they had an extraordinary brittleness; were frangible, and scarcely capable of being cut.

Such nails are very commonly a good indication of a gouty tendency, and a critical glance at the nails will often give a useful hint as to the diagnosis of the general relations of the malady specially complained of by the patient. Ear, teeth, nails, and skin, all may tell usefully of the general diathesis, or cachexia, and should be taken in carefully in that general observation of a patient which ought to precede all more special examinations.

The skin as might be expected varies in its appearance in the gouty. It may be thin so as to give the high complexion so characteristic of "high breeding." Indeed in young healthy active aspirants for gout in later days, there is a high complexion like "peach-bloom" on the ruddy side of the peach. In asthenic gout the skin may be pale and dry. In elderly persons of the lean kind the skin is often seamed with myriads of fine wrinkles, or deeper creases, from the absorption of the subcutaneous fat; while in the more corpulent, and well-nourished the skin is unwrinkled and glistens, being more or less oleaginous. The one resembles the thick unctuous glowing skin of a king pippin apple in spring; the other resembles the withered wrinkled apple—"as wrinkled as a John apple" is an old saying. In some spare individuals with considerable liver disturbance the skin has a dirty yellow hue, like discol-

oured parchment in hue and texture. The face is often pathognomonic, especially with the thickened temporal artery meandering underneath it. The artery, however, will be spoken of again, further on, the skin being under discussion here. The skin may be pale and dry; or in others pale and dry alternately with a flush and free perspiration, (Duncan Bulkley): while at times he has observed a "general fine desquamation." Then, too, there are certain actual diseases of the skin found with gouty conditions, if not actually excited by the presence of uric acid in excess in the blood.

Dr. Bulkley writes—"The diseases which are more commonly associated with the gouty state are eczema, acne, psoriasis, urticaria, and erythema: although it may further be stated that the gouty state or condition may often be of importance, in connection with almost all affections of the skin, and may even affect the course and treatment of syphilis. The special indications of the gouty form of the above affections are found in the intensity of the congestion and itching. In eczema a hard, red, shiny surface, with a tendency to watery exudations, drying into scales, with a good deal of burning and itching. In acne very considerable redness, and great redness about the central portion of the face. In psoriasis an acute development of the eruption with considerable redness and itching, and rather thin branny scales, extensive and distressing. While urticaria and erythema are more or less indicative of a lithæmic state." This itching of which Dr. Bulkley has spoken here as a marked symptom of the eruption being connected with gout, is worthy of being borne in mind. Years ago I observed that prurigo senilis was mostly asso-

ciated with a gouty state, and that itching is found when the skin is irritated by uric acid; just as itching is a characteristic of jaundice, when there are bile acids as well as pigments teasing the skin.

This itching has long been known in connection with toxic matters in the blood. Scudamore wrote:—"A harsh and dry state of the skin is a common attendant on bilious dyspepsia; and a distressing itching, particularly affecting the back and arms is very much complained of by those who are liable to gout. It not unusually occurs as one of the premonitory symptoms. An erythematous rash: and urticaria, or nettle-rash, also occur; and in one remarkable instance, I saw the latter irritation exist in a violent degree during two days before the paroxysm; to which, and the treatment adopted, it immediately yielded. Other forms of cutaneous complaint also occur to the gouty patient, in common with all those who have an unhealthy condition of the digestive organs. Itching of the skin, with or without eruption, is a very common consequence of an indiscretion being committed in the taking of certain acids, as pickles and unripe fruit; or, if this do not happen, the stomach and bowels are the more irritated and diarrhoea follows."

Then again the skin in gouty subjects is liable to variations of colour due to vaso motor disturbances. In some the hands "die," that is, they become cold and white, but usually dry; in this last, contrasting with the wet cold hands of nervous exhaustion. Sometimes the feet also are cold; in their dryness again contrasting with the cold feet of asthenia, especially in women. Then in other cases, mostly females, the skin is liable to deep flushes, which

can often be seen mounting over the neck and face. These "hot flushes" are most common with women at or after the menopause; not rarely these "hot flushes" and "dying hands" are found in the same individual; and whence so found co-existent are pathognomonic in their significance.

A persistent yet passing flush of the skin is mentioned by Graves. It occurred daily, at about three in the afternoon, and continued four or five hours. The upper part of the cheek was its seat, and it was accompanied by uneasiness but no pain. The skin first became bright red, and afterwards of a purplish hue.

Garrod has noticed "prurigo, general or local, pityriasis, psoriasis, in its different varieties, eczema, and acne," as the skin-affections chiefly connected with gout. Prurigo of the anus is often found with piles; while prurigo of the vulva is common after the cessation of the catamenia. (In my own opinion in these last cases it is well to look out for some glycosuria). He has observed the skin troubles to be relieved, as are other gouty manifestations by the joints becoming inflamed. So also is psoriasis which is common in gouty families. Likewise eczema, and acne. Such diseases are made worse by the internal use of arsenic, but yield to treatment directed to the gouty condition. My own experience tends in this direction, *viz.* gouty skin affections are found under two sets of circumstances. With articular gout, with a large heart and tight arteries in some cases; in others, with an absence of this condition of the vascular system, but with neurosial affections and dyspepsia, especially in persons of slight frame and the nervous diathesis: the latter associations often being misleading as to the gouty connection.

CHAPTER IV.

PATHOLOGICAL CHANGES WROUGHT BY GOUT POISON.

(Continued).

(INTERNAL CHANGES).

WHILE certain outward manifestations can be regarded as proof positive of the existence of gout, especially the implication of the ball of the great toe, which even the most sceptical admit, there are certain important internal changes which are equally worthy of our attention.

Perhaps indeed it is of more importance to fully grasp the effects of gout-poison upon the vascular system, both for the purposes of diagnosis, prognosis and treatment, than any other matter in connection with gout. These are (1) a high blood pressure in the arteries; (2) hypertrophy of the left ventricle (3) hard incompressible arteries undergoing the atheromatous change; and from these (A) Apoplexy by rupture; (B) Aneurysm; (C) Angina Pectoris during the period of high arterial tension; and (4) Fatty Degeneration of the Heart with Angina, still. Such are the grave and serious lesions of advanced life associated with gout.

At other times the changes in the circulatory organs are found without other evidences of gout, and then the case is often termed "Chronic Bright's Disease," *i.e.*, that form found with the small red, contracted, cirrhotic, or gouty kidney. This is a malady clearly differentiated in many important respects from Chronic Bright's Disease

with the large white, the fatty, or the amyloid kidney; a group of changes quite distinct from gout.

This subject is unfortunately in a tangled condition at present; and what I am now about to say is rather such a view of the subject, as it stands at present, as is readily comprehensible, without any violence to facts; rather than an attempt at any critical analysis of the different views of a brief character.

In 1817 James, of Exeter, observed certain modifications of the heart and circulatory organs in chronic kidney disease. Subsequently Bright formulated the matter thus:—"the altered quality of the blood might so affect the minute and capillary circulation as to render greater action necessary to force the blood through the distant subdivisions of the vascular system," and that this led to hypertrophy of the left ventricle. Rokitanski, the father of modern pathology, also recognised the fact of arterial degeneration, hypertrophy of the heart, and true apoplexy being associate conditions of chronic kidney disease. Traube wrote on the connection betwixt chronic disease of the kidney and cardiac hypertrophy. The subject has not escaped English observers.

Prof. Geo. Johnson, F.R.S., of King's College, has laid us all under a debt to him for his labours on this subject. He observed that in chronic renal disease there was a thickening of the muscular wall of the small arteries and arterioles in these cases; and attributed it to increased contraction of this muscular tunic, due to the abnormal qualities of the blood circulating through the vessels. This led to a damming of the blood in the arteries, a rise of blood

pressure, in its turn provoking increased action of the heart on systole (to overcome the resistance offered by the high blood pressure in the arteries), and with this in time, hypertrophy of the left ventricle. That this observation of Johnson's has had more to do with our present conceptions of the effect of gout-poison upon the vascular system than any other observations, may be at once readily and cheerfully admitted. But whether this hypertrophy of the muscular wall is the sole change in the small arteries is open to question. In 1852 Handfield Jones described a fibroid change in the arteries which he thought was not inflammatory. Later on this subject was taken up by Sir Wm. Gull and Dr. Sutton, who in 1872 read a conjoint paper on "Arterio-Capillary Fibrosis," that is, on a change which was a fibrous thickening rather than an hypertrophy of the muscular wall of the arterioles: and found along with renal fibrosis.

They held this a general fibrosis, in which the kidneys often share: but not necessarily so. They held that "the contraction and atrophy of the kidneys are but part and parcel of the general morbid change." Johnson is more precise, and his views more in accordance with clinical observations in certain cases, than the view of Gull and Sutton, which is interesting and to some extent instructive; but it must be admitted that if they found the subject in its infancy they have left it in its cradle. There is a certain luxuriance of growth of connective tissue around the small arteries and arterioles in several morbid conditions, which finds its worst expression in tuberculosis; but is found under other and totally different circumstances, as notably

in the nervous system of the subjects of the general Paralysis of the insane, for instance. The French authorities regard this last process as partaking of the nature of a chronic inflammation, a view not accepted by other observers; yet this instance suffices to show that there is some histological resemblance betwixt this excessive growth of connective tissue around the smaller vessels and chronic parenchymatous inflammation, otherwise known as cirrhosis, of the several viscera. Johnson's description of the state of the vessels has been corroborated by Drs. Quain, Garrod, Broadbent, Prof. Grainger Stewart, Ringrose Atkins, Da Costa, and others. That in those cases where there are present:—Hypertrophy of the left ventricle; accentuation of the second sound at the aortic root; tight arteries, becoming atheromatous; and a free flow of urine, the outcome of high blood pressure within the arteries; there is hypertrophy of the muscular coat of the arterioles, is more than merely probable; and that "it occurs with the constancy of a physical law" as Johnson states, seems warranted by the clinical facts.

On the other hand, the view of Handfield Jones followed out by Gull and Sutton, has found numerous supporters in this country and elsewhere: and that this view approaches an explanation of a general widespread change of a senile order and a degenerative type, also seems somewhat more than probable. There is a thickening of the fibrous wall of the arterial system found, in which the vessels of the kidney may partake. That able and rising physician, Dr. F. A. Mahomed, of Guy's, has taken up this subject in a broad and catholic spirit, and with much earnestness.

From his observations on febrile maladies at the London Fever Hospital, he soon learned that there was a rise in arterial tension in scarlatinal cases, which preceded in the order of time, as well as of pathological sequence, the kidney complications; that the renal complications, leading to albuminuria and uræmia were consequential to this rise in the arterial pressure. He pointed out—"that high arterial pressure is not a *consequence* but an *antecedent* of kidney disease." And he goes on to say that such high arterial pressure precedes Bright's disease under other circumstances: and further—"it occurs in them long before there is any sign of renal failure or organic vascular changes, which probably require, in most cases, years to develope. It therefore follows that these chronic conditions of high arterial pressure will produce in the kidney and elsewhere, the vascular and perivascular changes of Bright's disease." The view that a persisting condition of high arterial tension is an early stage of granular kidney, has been followed out by others.

There is indeed a condition of the vascular system which involves fulness of the arterioles of the viscera, and then connective tissue is freely produced; at first enlarging the viscera, and then in its contraction compressing the true structure of the viscera and crippling them functionally by this fibrosis and cirrhosis. The kidney shares in this; and when at the same time it is kept in a state of high functional activity by the constant presence of nitrogenised waste in the blood, in considerable amount, circulating through it, then the changes in it become pronounced. Especially, too, when the form assumed by the nitro-

genised waste is uric acid rather than urea—the normal form of such waste for the mammalian, and especially the human kidney.

To return, however, to Dr. Mahomed's lucid exposition of this matter. He says, in his thesis for the Degree of Bachelor of Medicine of the University of Cambridge,—“From these considerations it follows that we have to deal with three stages of chronic Bright's disease: first, *the functional stage*, which is limited to the condition of high arterial pressure without organic changes in either the vascular system or the kidneys; second, *the chronic Bright's disease without nephritis*, the stage of organic changes in the vascular system and in the kidney (for which, if thought desirable, the term ‘arterio-capillary fibrosis’ might be employed); third, *chronic Bright's disease, with nephritis*, the natural but by no means the invariable termination of the disease.” This gives us the position, to my mind at least, very accurately. This vascular condition may terminate in other changes than resultant renal changes; according to circumstances. My observations on General Paralysis of the Insane, at the West Riding Asylum, Wakefield, when the superintendent, Dr. Crichton Browne, now the Lord Chancellor's Visitor in Lunacy, published *The West Riding Asylum Reports*, (vol. iii.), tell me that there is in this malady a rise in the arterial pressure, a large left ventricle, and an accentuated second sound; but that the brain mainly suffers, undergoing changes similar if not identical with those found in the kidneys in others, notably the gouty. In fact we must learn to adjust our ideas so as to realise a widespread change going on in the vascular

system, which may specially involve certain viscera; and one more than another according to circumstances with which we are but yet imperfectly acquainted. We do, however, already know that when such change in the vascular system takes place in a gouty person, the kidneys are specially liable to be extensively involved. As to what these changes in the kidney are will be seen shortly.

It is not, however, in all cases of "gout," that this cardio-vascular change exists as above; there is at least one class, viz., those where there is a well-marked nervous diathesis in which the symptoms are rather neurosal with more or less of indigestion and skin affections, and in which the vascular system seems often to escape; the kidneys becoming gouty in time. But where there is a broad solid frame, with large bones and muscles, and a well-developed vascular system, then this cardio-vascular change is almost certainly found, and with it usually articular complications; skin affections belonging to all classes of gouty persons. For such a cardio-vascular condition, I have adopted the expression "the gouty heart," and as this, in my opinion at least, conveys a better and clearer impression to all minds, medical and lay, than any other; I shall adhere to it here.

The Gouty heart consists of two stages, (1) Growing Hypertrophy; and (2) Failing Hypertrophy.

Growing Hypertrophy is the first stage. It may be briefly described as, first a condition of high blood pressure within the arteries. This is connected with some spasm of the arterioles, and ultimately with hypertrophy of their muscular coat, produced therefrom. By such hypertrophy

the escape of blood out of the smaller arteries is obstructed, and the blood is dammed up in the large arteries. This gives the tense pulse of well-filled vessels; and all the energy displayed when the brain is well-flooded with blood. This high arterial tension leads to hypertrophy of the left ventricle in this way. When the arterial tension is high there is more obstruction offered to the contracting ventricle on systole in forcing the blood into the aorta, than is the case when the arteries are comparatively unfilled; and so the walls of the ventricle thicken by the development of the muscular fibrillæ in a manner fully discussed and explained in my work on the "Heart and its Diseases," Chap. V., Hypertrophy and Dilatation. When the nutrition of the tissues is defective, then, instead of hypertrophy, dilatation of the ventricle is the consequence of a high blood pressure in the arterial system. Therefore in some gouty cases there is dilatation of the heart, usually with some co-existing hypertrophy, instead of pure hypertrophy: and this is more liable to occur in women than in men, for women are more apt to suffer from imperfect nutrition than are men. We find, then, a tight artery with muscular hypertrophy at both its central and terminal ends, by which the condition of high arterial pressure is maintained. This over-distension of the arteries, *ueberspannung* the Germans call it, causes a growth of connective tissue under the tunica intima of the arteries; which, when well-pronounced, is called atheroma. This is most marked at the outside of a curve, as the aortic arch; and at points where the artery is frequently bent, as at the popliteal and axillary spaces. This high arterial tension causes the aortic recoil

to forcibly distend the aortic root, including the aortic valves, and so the second sound produced thereby at the heart, is accentuated. This is a diagnostic matter of cardinal importance. This strain is apt to lead to inflammation of the valves (valvulitis), and aortic valvulitis is a common accompaniment of the gouty heart.

The patient when seen at this stage is usually a healthy-looking active person. But unless this valvulitis be set up, the individual does not present himself before a medical man; indeed individuals in the first stage of the gouty heart are extremely energetic persons, capable of great exertion bodily and mental; the best workers of the social hive very commonly. For years, and years in many cases, this condition is maintained without failure or decay of the organism.

Attacks of gout in some of its multitudinous, and Protean forms are apt to show themselves indeed, but the general condition is one of energy.

But in time, and often only after a long time, the scene changes like a dissolving view; and at last another state of affairs is established. The nutrition of the heart fails, the blood pressure is no longer fully kept up in the arteries, and the veins fill. When this condition is established we find the following grouping of signs and symptoms.

Failing Hypertrophy. The heart is failing and there-with dilatation is on foot. Hypertrophy has arrested the dilating process, so long as the tissue nutrition is maintained; but when it fails the muscular fibres yield, and dilatation sets in. Hypertrophy's arresting finger is lifted, and a dilating process is set up which can never be

arrested; though it may be delayed by proper measures. Why does the nutrition fail in these cases? (1). Because the aorta becomes less elastic as the atheromatous process goes on, and so its recoil is diminished. (2). The atheromatous process involves a thickening of the arteries on their inner surface, and with that a diminution of their calibre; and this is markedly seen in the coronary vessels. Consequently the blood-flow into the hypertrophied heart is cut down, and with it the nutrition of the muscular fibrillæ; and fatty degeneration is established. Such indeed are the usual antecedents of the fatty heart. The molecular necrosis is the latest result of antecedent causes, long in operation ere it is produced. The hypertrophied heart now begins to stagger, and its rhythm is impaired. Exertion tells upon it. It palpitates on effort; or it is unequal to effort; and syncope, or an approach thereto, follows any demand upon it. In the latter case the pulse is apt to be intermittent, and many contractions of the heart fail to affect the pulse at the wrist; the current, or flow of blood set up by the cardiac systole is too feeble to enable the blood-wave to be felt at that distance from the heart. Where there remains a quantity of muscular fibre still undecayed, then palpitation on effort is possible. But this matter is too complicated to be followed out here.

The dangers of apoplexy and aneurysm are still existent. If the heart is decaying, the arteries are rotting too. The heart-decay becomes then "a preservative lesion" (Crisp); still the weakened heart may yet be strong enough to rupture the unsound arteries. Angina pectoris, of little gravity while the heart-walls are sound, now becomes a very seri-

ous matter ; and sudden death from angina is quite common with failing hypertrophy in the gouty. (It is unnecessary to enter into the pathology of Angina Pectoris here ; the reader who wishes to go further into the matter will find it dealt with in Chap. XI. of the " Heart and its Diseases"). But in many cases Angina, except in a very imperfect form, is absent all through ; and the heart-decay goes on to dropsy, and the other outcomes of a failing heart.

One point there is of great moment in connection with these cardio-vascular changes, and it is the bulk of urine ; *i.e.* the amount of water excreted by the kidneys. When the blood-pressure is high in the stage of growing hypertrophy, the bulk of urine is large. And copious urine is dilute urine (under all ordinary circumstances), as regards urine solids. When the vigour of the heart begins to fail, and the blood pressure in the arteries to fall therewith, then the bulk of urine is diminished. This change from a large to a lessened bulk of urine is a most significant matter, as Sir W. Jenner has pointed out ; for it tells that growing hypertrophy has passed its acme, like the sun when it ascends to the zenith begins to lower westward—and that the stage of failing hypertrophy is reached. In both stages there is a tendency to get up during the night to empty the bladder ; nor is there any more suggestive semeion of this change, albeit it can not be satisfactorily explained.

Such then is the natural history of the changes in the heart and arteries, in gouty subjects. Sooner or later, unless cut off by some inter-current disease, or gouty affection, the evidences of heart failure manifest themselves as

the sunset of life is approached, and "the shadows lengthen eastward." The changes of failing hypertrophy; when molecular necrosis is cutting down the structural integrity of the heart, and with it the functional vigour, are those of progressive dilatation. Less frequently of fatty degeneration without dilatation.

Having grasped this essential part of the cardio-vascular changes of gout, otherwise "the gouty heart"; the reader will comprehend all the more clearly the valvular affections found therewith. These are related to the aortic and mitral valves. Aortic valvulitis as an outcome of gout has long been recognised. In his work on "The Diseases of the Heart" 1851, Wardrop devotes a chapter to "Gouty inflammation of the Heart"; and a very interesting chapter it is to those who look at the diseases of the heart from a standpoint admitting of something more than the mere physical signs thereof.

The most common form of valvulitis found with gout is that which was well seen in the case of George the IVth. "The three semilunar valves at the beginning of the aorta were ossified throughout their substance, and the inner coat of that blood-vessel presented an irregular surface and was in many parts ossified." Wardrop held that deposits of urate of soda and phosphate of lime form in the inflamed valves. Whether this is a primary deposit of urates, as occurs in the articulations; or there is inflammation first, and then a secondary infiltration of urates and phosphates afterwards, in the affected structures: is a matter still *sub judice*. The tendency at present is to regard valvulitis as causally related to strain; as it undoubt-

edly very largely is. The high blood-pressure in the arteries causes the aortic valves to be forcibly closed, (hence the loud second sound), and in time this leads to valvulitis. The usual form is that of stenosis; the mischief attacking the arterial conus, and the base of the valves first. There may be at times such contractions of the valve-curtains as permits of some regurgitation: but this is not essential. Nor does such lesion obliterate the second sound. This is caused by the tension of the whole aortic root, its sides as well its base, on the aortic recoil; consequently the second sound may often be clearly distinguished through the murmur caused by the valvulitis. This is apt to be forgotten, yet it is important to remember the fact, as aneurysm of the first part of the aorta is not uncommon with the gouty heart. Aortic valvulitis may, too, be accompanied by dilatation of the aortic arch with roughening of the internal surface; which gives rise to a perceptible thrill, as well as a murmur. Such associations of the gouty heart are now generally recognised.

Mitral stenosis as an outcome of gout, and a condition linked with the gouty heart is less widely known. Yet when the high blood pressure in the arteries forms an obstacle to the onward flow of blood on the ventricular systole, and hypertrophy follows; it is clear, abundantly clear, that there results abnormal strain on the mitral valve-curtains. In time they may become affected; and stenosis is the most common form assumed. As in the aortic valves the bases of the valve-flaps are the parts first affected; but again there may be such distortion set up in some cases as to cause insufficiency with regurgitation. As such stenosis

modifies the tense pulse (1); and the murmur is only heard over a very limited area (2); this complication of the gouty heart is often overlooked. But the more it is looked for, the more frequently will it be found. When it sets in, then dropsy of cardiac character is developed while the muscular walls of the heart may be structurally sound. The symptoms however being, in each valve condition, those of heart-failure.

The changes found in the heart and other organs in a case of persistent gout in an old man of gouty family, in his seventieth year, are given by W. Gairdner as follows, and are very instructive. "Heart large and thickness of its parietes natural. Aortic valves *very nearly* perhaps not *absolutely* healthy. Some points of ossification were observed about their roots, but not affecting their form. In the mitral valve some of the columnæ carneæ, at the points of insertion into chordæ tendinæ, were changed into a whitish dense texture. The aortal segment of the valve was thickened in particular parts, which were of the density of cartilage. Dimensions of all the cardiac orifices normal; valves of the right side of the heart also normal. The muscular substance of the heart and more especially of the ventricular septum, appeared, when closely examined, to have undergone a change; having become of lighter colour with a tinge of yellow, and having lost a part of its natural fibrous appearance. It could be torn however into short fibres, which were easily lacerable. *Aorta.* The arch was very considerably dilated, but without any deposit in its tissue. *Kidneys.* Secerning portion of a light ochery colour, more especially in the right kidney. Tubular part

was of the proper proportion to the cortical. *Liver.* Was paler than it ought to be, and unequally pale, particular spots being quite anæmic. It was also softer and more soapy to the touch than natural. Its size was normal. *Microscopic Examination.* The ultimate texture of the heart had undergone the granular degeneration; the fibrillæ were easily broken up, the striæ being everywhere in great part supplanted by irregular granules. The epithelium of the liver and kidneys, and the tubuli of the latter were also filled with fatty granules and globules. Such is the account of the pathological changes found after death. They are those of fatty degeneration of the heart, without previous hypertrophy; and so indicate a case somewhat different from the ordinary gouty heart. What were the symptoms in life for five years? They were those of heart failure. Faintness. Giddiness. Distress on walking up a hill. Pains in the chest, for which spirits and water gave relief". At last he died suddenly in bed of syncope. Such is a very clear case of fatty degeneration of the heart without any antecedent hypertrophy. It will repay frequent pondering over, in the relation of the clinical symptoms to the morbid changes found after death.

Then the kidneys become changed in gout.

The gouty kidney is small, red, contracted and granular. It may contain cysts; or it may also be somewhat fatty. In the early stage, to follow Mahomed—the kidney "is purely red, more or less granular, the capsules will be somewhat, and perhaps extremely adherent, the cortex atrophied little or much, the cut edge crenated, the arteries distinctly thickened, gaping and prominent; the heart

more or less hypertrophied ; in some cases the kidney may look perfectly healthy, perhaps the arteries alone may look a little thick. The microscope in these cases will show thickened membrana propria of the tubules, thickened capsules of the Malpighian tufts, more or less intertubular fibro-hyaline thickening, the arteries thickened both by hypertrophy of the muscular and fibro-hyaline thickening of the intima and perhaps of the adventitia ; the epithelium will be normal or a little granular, not increased in quantity. It is the kidneys in the second stage, or red granular kidneys which, in my opinion, give rise to no albumen in the urine, nor any dropsy ; they can be diagnosed by the cardio-vascular signs only. These kidneys differ from those of the third stage, inasmuch as the latter to the naked eye show grey or yellowish granulations of the cortex, these appearances being due to the excessive proliferation of the epithelium of the tubes ; the condition is so distinct that it is easy to recognize, by the presence of grey or yellowish mottling, the existence of any epithelial changes in the kidney. Those latter kidneys almost invariably give rise to albuminuria and not unfrequently to dropsy. These epithelial changes may probably come and go at any time in a kidney of the second stage, giving rise to numerous exacerbations and inter-current acute attacks to which these cases are so liable." I introduce this quotation to shew the reader the pathology of cases where albumen shows itself in the urine. The gouty kidney is usually free from these epithelial complications which give rise to albuminuria.

So far back as 1782, Henry Watson has spoken of con-

tracted kidneys with cysts in gout; and the association has been recognised by all pathologists since that time. To follow Wilks and Moxon: after speaking of other forms of chronic kidney change, they say of granular kidney "this is chronic and insidious from the first, and is at no period acute like the large white, nor is it a mere part of a general lardaceous disease in the abdomen, like the lardaceous kidney. We generally find the kidney much smaller than natural, and with its capsule thickened and adherent. The surface is not smooth, but on the removal of the capsule, seen to be irregular and minutely nodulated with small projections, which are now referred to in the title 'granular' applied to the kidney. The general figure of the kidney is retained, but numerous irregularities of surface much deface its form." The kidney may contain grey or yellowish white streaks through lodgment of fat in the tubules. The cortex is thin, and minute cysts may be seen in it. "The masses of cortical tissue between the pyramids are less wasted; the pyramids themselves are not wasted at all. They are large—some thick hypertrophy vicariously—and may show small chalk-like dots, which are minute calculi made of crystals of urate of soda—such urate as constitutes gout elsewhere: these crystals generally occur in gouty cases, and are thought to signify gout, even when there is no history of gout or sign of it in other parts; but this conclusion is not so secure as it would be if urates were not passing constantly down the tubes." Garrod thinks the crystals of urate of soda "to be imbedded in the fibrous structure itself, rather than within the cavities of tubules." Wilks and Moxon go on to say—"When the

microscope is used then you see that the change is of a simple kind. The cortical tissue of the kidney is wasted, especially under the depressions of the surface, the elevations or granules being the best part of the organ, though the name 'granular disease' of the kidney seems to level the accusation at them. The wasting is seen to be very unequal, so that some bundles of tubes suffer more than others. They suffer in two ways, some shrivelling up, almost or quite completely; while others are dilated. The shrivelled ones often in parts are reduced to scarcely traceable cords, but in other spots a small portion of their epithelium is preserved, and this epithelium appears as a round or oval body, composed of cells enclosing a hyaline-looking mass. Other tubes dilate, and these, are perhaps, equally spoilt as to usefulness, the dilatation of tubes so tortuous forms cystic hollows, whose communications are hard to follow. The blood vessels are often excessively affected, not only the main renal artery, but its branches, which you may perceive projecting on the cut surface, and which you may often meet with in microscopic sections, showing very thick walls. But a general thickening of the arteries of the body is usually present in these cases, and they generally show more or less evidence of degeneration of tissue as well as thickening."

So much then for the actual change wrought in the kidney. In some cases crystals of uric acid may be found freely formed: both in the tubules and in the pelvis of the kidney. Probably the history of a calculus runs as follows. A rhomb of uric acid is formed in a tubule of the kidney, it is dislodged and is washed into the pelvis of the kidney.

There it lodges and grows. After a while it is displaced by a shake, as a fall in the hunting field, and finds its way into the ureter, where it may set up renal colic; after passing the ureter it reaches the bladder, and is either passed by the urethra as "gravel," or remains in the bladder to grow into a "stone." Gravel, renal colic, and stone (uric acid) are all found linked with gout.

As to the production of these renal changes by gout-poison it would seem—"The condition of waste-laden blood leads to a high arterial tension, which is felt in the kidneys as well as elsewhere; and betwixt the high vascularity and functional activity, the blood being laden with nitrogenised debris, the kidneys in time undergo an interstitial growth of connective tissue: which slowly and steadily pervades their structure and destroys their functional activity. The cardio-vascular changes may not always be consequent upon, and subsequent to changes in the kidney; it is very probable that in many instances the changes in the circulatory system and in the kidneys are alike the result of a condition standing in a causal relation to each, viz., a condition of lithiasis when the blood is overladen with nitrogenised waste." (*The Gouty Heart*).

Sometimes the bladder is rendered very irritable, and the urethra smarts when the acid urine passes over it; especially is this liable to happen when sharp angular crystals are lacerating the surface. Cystitis, or urethritis are not unknown in gout.

Of the state of the liver in gout less is known. Gairdner thinks that this viscus partakes of the general plethora of the chylo-poietic organs met with in gout. Of course

where there is alcoholism linked with gout, then the liver is enlarged, its surface is very hard, the "nutmeg liver": then the increase in bulk is followed by contraction and diminution in size "cirrhosis" indeed. When the heart fails whether from muscular decay, or valvulitis, then the venous congestion causes enlargement of the liver. Beyond this the liver furnishes no particular indications in gout.

Certain, however it is that uric acid is formed in organic disease of the liver. "How frequently does it happen that the slow and silent progress of some deep seated malady will induce a development of lithic acid to an enormous extent, quite irrespectively of the food taken; in no class of cases is this more conspicuous than when there is chronic disease of the liver," Todd. This statement throws a strong side-light upon the liver being disordered, as the cause of the formation of uric acid. That cirrhosis of one viscus is accompanied by cirrhosis of other viscera is a commonplace fact of the dead-house. Thus Dickinson has found cirrhosis of the liver frequent with interstitial nephritis, and so has Grainger Stewart: while the spleen has also been found to contain abnormal amounts of connective tissue in kidney-cirrhosis. Charcot has seen it accompanied by interstitial pneumonia.

There are indeed developments of connective tissue in various viscera in the cardio-vascular changes of chronic Bright's disease with granular kidney, which is so closely allied with gout that it is impossible to separate them. The high arterial pressure leads to a luxuriant growth of connective tissue. Charcot puts it thus, as regards "pri-

mitive chronic-interstitial nephritis," the term he uses for kidney changes—" *a.* the initial act is the formation of young cells which represents an embryonic tissue; this undergoes progressive organisation, and soon assumes the appearance of fibrillar connective tissue. *b.* This new tissue formation takes place particularly: 1st. about the convoluted tubes; 2nd. about the glomeruli; 3rd. about the principal vessels. *c.* The newly-formed tissue is endowed at a certain period, with the property of retractility." It is this last which does the actual damage to the secreting portion of the kidney.

The relations of gout poison to the nervous system are both numerous and interesting.

The first relates to apoplexy by rupture. The atheromatous changes in the arteries involve those within the skull. After death the larger arteries are found on section open, rigid and quill-like; from their walls being stiffened by the development of connective tissue in them, or they may become calcareous. The consequence is that such vessels are liable to rupture, and so apoplexy supervenes. Rokitsanski long ago pointed out the relation between kidney disease, heart hypertrophy and apoplexy from rupture. Such rupture is induced when any strain is put upon the encephalic vessels, as by vomiting: or when the internal blood-pressure is raised by passing excessive accumulations of nitrogenised waste in the blood, producing further contractions of the arterioles, when the larger vessels are severely tried; or by a sudden fall of the external temperature when the vessels of the skin contract, and the internal parts are filled with blood. When such changes

of weather are sudden and pronounced, a number of deaths of elderly persons are announced in the press, from the maladies associated with a rise in the arterial pressure—apoplexy, aneurysm, angina, or failure of a decayed heart-wall—in the face of the increased obstruction to be overcome in systole.

Gairdner discusses the matter of a “nervous apoplexy” in gout. He writes—“I fear I shall hardly obtain the assent of some of my readers, when I state my conviction that gout is sometimes the cause of death, without any intervening processes, like those I have detailed above. Such are the cases of sudden death, so often heard of in gouty persons, and generally, but very arbitrarily, referred to gout at the brain or gout at the heart. I believe that many of these cases are only syncope, too profound and too long continued.”* He then gives cases in support of his view.

Gout at the stomach is probably due to some irritation of the fibres of the vagus, perhaps set up gout in the solar plexus. Certain it is that a curious depression of the heart is seen in certain cases of suppressed gout. The patient is confined to bed, the pulse is small and scarcely to be detected; any movement seems to bring on syncope. The situation appears full of the most imminent danger. It clears up with an attack of gout usually at the great toe. Such a case, very well-marked indeed I saw a little time ago

* In a foot note he quotes “Schoelin also ascribes the sudden death of many gouty patients, without sufficient post-mortem cause being discovered, to a dynamic paralysis of the nervous system—to a true nervous apoplexy.”

with Dr. Hilliard of the Caterham valley. Gout at the stomach, Sir Thomas Watson thought, often may be "pork in the stomach." That a profound impression may be made on the sympathetic or ganglionic nervous system by an indigestible mass in the stomach is certainly within our experience. Such phenomena are allied to those "intermissions of the pulse, palpitations, and faintness (which) mark the part the heart takes in the general disorder" as the gouty state becomes more advanced, and the structural integrity of the heart walls becomes impaired. Just as angina pectoris becomes more serious when degeneration of the heart wall becomes established, so any irritation exciting or throwing the inhibitory fibres of the vagus into action will be more clearly fraught with danger in a heart the seat of fatty degeneration, than in a heart structurally sound. The "lithæmic vertigo" of Da Costa is evidently due to some arrest of the flow of arterial blood into the brain—possibly the cerebellum more particularly—more or less remotely connected with the state of the heart. Certainly such vertigo is common among gouty subjects. Whether it is that the blood supply of the brain is interfered with, or the gout-poison acts in a directly toxic manner upon the brain-cells, or both, there is no question about the relation of gout to melancholia. The late Lord Chatham was an instance in point. Two years of horrible depression unfitting him for work of any kind, rendered him irritable to an agonizing extent, preceded and was relieved by an attack of articular gout. (This subject will be taken up further in the next chapter.

Not only is the brain disturbed, but even in some cases

texturally altered, in cases of high arterial pressure, as my own observations on the general paralysis of the insane would tend to show; and where exacerbations of excitement with violence seem to correspond with gouty exacerbations in other persons. Dr. Da Costa has investigated the condition of the ganglionic centres in Bright's diseases. He found certain changes in the renal ganglia. In one case the ganglia were altered as follows: the capsule of the ganglia contained closely-matted connective-tissue. "Its vascular supply consisted of numerous large thick-walled vessels, especially the muscular tunic. The connective-tissue was very marked along the nerve-trunks, and penetrated the ganglion-mass along with them. The connective-tissue encroached closely upon the ganglion-cells, and often formed concentric coarse-fibred rings around them. The cells around which the connective substance was the firmest, generally showed greater degenerative changes than their fellows, but this appearance did not universally hold." Thus we see that the growth of the connective-tissue in the kidney, extends even into the renal nerve-ganglia. "The ganglion cells present changes such as are usually described as fatty degeneration and atrophy. There is a breaking down of their substance into granules and fatty globules, which more or less obscure the nucleus, and even when the nuclei are visible they show more or less the same changes." He thinks that this follows upon the excessive connective-tissue formed. "The connective basis substance of the ganglia has apparently passed through the active stage of hyperplasia, and is undergoing the contractile process which we are so familiar with in

the kidneys, and which we have also found to have taken place in the tissues outside the ganglionic masses. This substance has passed the active stage of formation, and its elements also are undergoing degenerative changes." (Researches on the state of the Ganglionic Centres in Bright's Disease, by J. M. Da Costa and Morris Longstreth, *Amer. Jour. of Med. Sciences*, July, 1880). Their observations were not confined to the renal ganglia. The cardiac ganglia undergo changes which they believe are linked with the muscular hypertrophy. They say:—"We are inclined to believe that the hypertrophy of both the heart and the vessels is to be traced to a central origin; in one case to the cardiac ganglia, and in the other to the renal. The same statement applies to the changes in the vessels and tissues in other organs of the body, and when they, in their turn, are affected, the ganglia which preside over them as centres most probably have been acted on in a similar manner, as the ganglia already mentioned." The relations of ganglionic changes to gross visceral disease are most interesting. That such local changes are found where there is, general cardio-vascular condition as in chronic Bright's disease, is a fact full of suggestion. Changes are found in the cervical ganglia in cases of the general paralysis of the insane, which has many points of resemblance to fibrosis of the kidney, as said before. But the subject cannot be further dealt with here.

Recently I saw a gouty man of 70, with a large heart, tense arteries, and gouty bronchitis, with emphysema, who had symptoms of locomotor ataxy developing; which I could not help thinking causally connected with his state of heart and arteries, and probably kidneys.

One part of the nervous system is especially liable to suffer when kidney mischief is established, and this is the retina. The retinitis of albuminuria consists of white spots, often arrowy in shape, with small hæmorrhagic striæ; clots from rupture due to high arterial distension with degeneration of the walls of the vessels. Permanent impairment of vision follows. This must be distinguished from the sudden and temporary blindness sometimes seen with uræmia. But these maladies are connected rather with the large white, than the gouty kidney. Deafness also may be linked with renal disease.

The serous membranes are very liable to be affected when renal disease is established: and in uræmia the pleura, pericardium, peritoneum, and serous membranes of the brain, are commonly found to be inflamed. Ligation of the ureter in serpents, has been followed by deposits of uric acid on their serous membranes. The serous structures of joints are also liable to gouty changes—and the deposit of uric acid in them. Scudamore says:—"The synovial secretion frequently fails in its healthy quantity and quality as a consequence of deep-seated gouty inflammation; whence arise stiffness and lameness of the joint, with snapping, and an indefinable sensation of dryness in the parts upon motion."

The mucous membranes are altered in gout.

Laryngitis not unknown. Dr. Langmore has related to me a severe case which only yielded to gouty remedies, the patient being a gouty subject. Garrod has found deposits of gouty matter in the arytenoid cartilages. While Bence Jones has found a deposit of urate of soda in the

walls of the bronchial tubes; a fact of much value in throwing light upon the local causes of gouty bronchitis. The gastro-intestinal canal is often affected, and especially the stomach. Severe gastric symptoms followed by the voiding of much acid fluids are found in the gouty. Chronic acidity with dyspepsia is certainly common among gouty persons. Whether uric acid is found, or not, in the secretion of the gastric tubules, is not yet certain: still it seems probable. Piles are certainly commonly found with gouty individuals; any bleeding from them often gives much relief. Hæmorrhages from mucous membranes may be critical; or be relieved by an attack of gout. But hæmorrhages from the nasal membrane I have learnt to dislike; and Gairdner holds epistaxis a formidable occurrence and a common forerunner of disease of the heart.

Another form of hæmorrhage is menorrhagia found with women about the menopause. It is apt to be accompanied by severe pain at the menstrual period at or before the change of life (Laycock); and is then very suggestive of gout.

Gout may affect the roots of the teeth, and in many persons the teeth come out without caries, but with some periostitis in the roots, and sometimes an osteoid growth along the fangs. Gouty toothache is certainly not a mere freak of the imagination.

Gairdner says—"I have seen the tonsils so sharply seized with gout as in the absence of any considerable degree of inflammation, to induce me almost to accuse the patient of exaggeration, till an unequivocal symptom of gout explained the mystery. The same thing is very frequently

witnessed in the teeth, where severe toothache, without the smallest decay of these organs, owes its rise to gout."

The diagnosis of such cases as gouty in their nature depends to a great extent upon the *tout ensemble* of the patient, there being a gouty type which the eye learns to recognise; to a lesser extent upon the suddenness of the onset, and the acuteness and severity of the pain. Just as in some cases the intense itching of the skin puts the observant thoughtful medical man upon his guard as to the suspicion of a gouty factor in the case.

Such then are the inward pathological changes set up by gout. Their proper consideration will enable the reader to proceed to the next chapter in which that very important matter, "The Diagnosis of Gout," will be fully discussed. For it is by a right comprehension of the universality of gout, its pervadence of the whole organism, that a correct estimate alone can be furnished. Thus Budd whose discernment and capacity no one will be so presumptuous as to call in question, wrote—"Almost every organ has been named by authors as the occasional seat of gout, and every ailment of gouty persons has been attributed to this Proteus." (Library of Medicine).*

* As the hostile critic—a species of the genus homo of which I have seen somewhat, although my general experience at the hand of the critic has been an agreeable one—might take me to task for my use of the word Protean as applied to gout, I beg to draw his attention to the employment of the term here by Budd, a generation before I adopted it; and by Mason Good long before him.

CHAPTER V.

THE DIAGNOSIS OF GOUT.

The following fable has always struck me as bearing on the question of the diagnosis of gout.

"A Dervise was journeying alone in a desert when two merchants suddenly met him. "Holy man! we have lost a camel" said the merchants. "Was he not blind in his right eye, and lame in his left leg?" asked the Dervise. "He was" replied the merchants. "And was he not loaded with honey on one side, and with wheat on the other?" "Most certainly he was," and as you have seen him so lately and marked him so particularly you can in all probability conduct us to him." "My friends," said the Dervise, "I have never seen your camel, nor ever heard of him, but from you!" "A pretty story said the merchants," but where are the jewels which formed a part of his burden?" I have never seen your camel, nor your jewels," replied the Dervise.

On this they seized him and forthwith hurried him before the Cadi; but, on the strictest search, nothing could be found upon him, nor could any evidence whatever be adduced to convict him either of falsehood or theft. They were about to proceed against him as a sorcerer by bastinadoing him when the Dervise, with great calmness thus addressed the court:—

"I have been much amused with your surprise, and own that there has been some ground for your suspicions: but I

have lived long and alone, and I can find ample scope for observation even in the desert. I knew that I crossed the track of a camel that had strayed from its owner, and not been stolen, because I saw no mark of any human footstep on the same route. I knew that the animal was blind of an eye because it had cropped the herbage only on one side of its path; and that it was lame in one leg from the faint impression which that particular foot had produced upon the sand; I concluded he had lost a tooth, because where he had grazed, a small tuft of herbage had been left uninjured in the centre of the bite. As to that which formed the burthen of the beast, the busy ants informed me that it was corn on the one side; and the clustering flies, that it was honey on the other!" (Cotton).

There is a class of mind at once shallow and ungenerous, which can believe only in what it itself can see; which would rather declare that it disbelieved the Arab's statement that he had not actually seen the camel, and that his inferences were not solely the outcome of his acumen, rather than give him the credit due to him for close observation. Such a mind prefers to believe that a better mind, intellectually and morally than its own, told a deliberate lie (without any adequate motive) than admit that what was impossible in their own case, is attainable by others. There would be no satisfaction in believing one's own superiority over a mind of that order. Nor does the charge of overweening vanity lie at one's door for saying so?

Such minds will never grasp the diagnosis of gout: it is almost needless to say. But as they are not likely to peruse any work of mine I shall put them aside, and appeal to a

better class of readers. It is waste of time to attempt to educate the ineducable. Gout cannot be demonstrated in a test-tube ; or mounted on a slide with Canada Balsam, and seen through a microscope ; though Garrod's " thread test " (p. 15) can often be utilised no doubt.

A good knowledge of the nature of gout-poison alone will endow the mind with the power to grasp the clinical phenomena, which are the outward visible signs of the inward venom. Perhaps what I have just said will appear less egotistic if a quotation from Gairdner be adduced in support thereof.

" In the beginning of a physician's practice, especially while he is yet unfamiliar with any but the noted and typical forms of disease, the changing and mysterious phenomena of gout, and particularly its complications with other disturbances of the system or injuries of parts, are full of doubt and difficulty."

As years roll on, and case after case reveals to him the multitudinous forms of gout, perhaps in the effects of treatment more than anything else, the practitioner learns to know gout ; and from an early scepticism becomes so ardent a believer often, as to excite in his juniors the scorn he felt in his early days, for the wisdom of his elders. In order to diagnose " gout " it is essential to be familiar with its " natural history." " The careful study of the natural history of diseases ought always to be an object of paramount importance to physicians " is the initial sentence of Todd's Croonian Lectures on Gout and Rheumatism. Especially is this true of gout ; for it is by such an acquaintance with its natural history that we know it whether

in its typical outbreaks, or its subtlest internal effects upon the mind. And perhaps the most constant phenomenon of gout is mental irascibility; irritability with a certain element of depression in the actual attack: in the intervals, or in suppressed gout in some persons there may be great energy. But here on the threshold the mutability of the symptoms meets us. There are good tempered, good natured gouty persons who are genial through the worst attacks. There are others who are irritable at the best of times; and in whom the smallest amount of uric acid circulating among their brain-cells produces the mental attitude commonly spoken of as "pure cursedness." The mental attitude varies as do the physical indications of gout. What acts perniciously on one brain is a stimulus to another brain; and the gouty, as a rule, are mentally active—in some way!

Sydenham gets his crumb of comfort in the reflection that Gout "kills more rich than poor, more wise than fools"

Gout may show itself in very early life, though a malady of adults and still more of middle age and advanced life. Morgagni has seen it in infants, and Gairdner says—"But that which will be received with some doubt is the fact which I have distinctly witnessed more than once, of a fit of regular painful gout in infants at the breast. My attention was called to this by a mother familiar with gouty appearances both in her own family and in that of her husband. I think I saw one child, so affected, destroyed by pain alone." Gairdner sees that this statement will be received with doubts; but from what I have heard from

different medical men, there seems no difficulty in believing what he says. Certainly I myself have seen infants, when I was the Resident Medical Officer of the Leeds Public Dispensary, who had gout. Their urine scalded them, they cried when they passed it, their mothers averred : they were stout strong florid infants, and their usual history was they "were fond of a bit of meat," and their fathers indulged them, giving them the meat to suck when too young to chew it ; after that to eat. Stopping this practice and prescribing a little potash soon got them well of their lithiasis. Surely this was "gout" ?

Gout has been described under different headings in order to meet the difficulty of its numerous and varied manifestations. Thus it is spoken of as :—

1. Regular.
2. Recurrent.
3. Retrocedent.
4. Irregular.
5. Suppressed.

"Regular" gout includes mainly podagra and cheiragra ; *i.e.*, inflammation of the small joints of the extremities.

"Recurrent" is applied to that form where attacks of gout recur from time to time, leaving the patient to all intents and purposes well in the intervals ; no matter how short, or how long.

"Retrocedent" when some well-recognised form of gout recedes, and some other manifestation takes its place.

"Irregular" is applied to gout when its phenomena are sometimes articular, at other times connected with the air-tubes, or skin, or may be with the stomach, or mucous membranes.

"Suppressed" is a term at once useful and comprehensive; including mainly the disturbances of the nervous system which are so often found with the *tout ensemble* of gout, and are relieved by a regular attack of articular gout. Perhaps it takes one more real hard work to get a fair grip of "suppressed gout" than of any other matter about gout: even though, like Sydenham, personally familiar with it. This entails the careful study of the relations of the varied phenomena to gout-poison. Pondering over subjective sensations, as well as minutely observing others; Sydenham commences his "Treatise on the Gout" by saying—"Without doubt Men will suppose, that either the Nature of the Disease I now treat of, is, in a manner, incomprehensible, or that I, who have been troubled with it thirty-four years, am a very dull Fellow, seeing my observations about it, and the cure of it, little answer their expectations." The "cure" certainly, learned Sydenham, does look a little like a misnomer if after thirty-four years you are getting worse, as you state in your Preface.

And after thirty-four years, with your unquestioned ability, you are doubtful about its diagnosis! No wonder then that young practitioners fresh from the hard and fast teaching of a medical curriculum "do not know it when they see it;" as Fordyce Barker said to me about gout in the United States, and its recognition; or rather the want of it. Nor on the other hand is it hard to believe that the man who does not study the features of gout carefully fails to identify it at one time, and then at another falls into the opposite extreme of calling something else "gout" which is not gout; nor can we forget what Sir Charles Scudamore

says after describing the complexity of gout and the influence of the gouty habit upon inter-current maladies—"gouty persons are not exempted from other diseases; nor are the various morbid sympathies which they suffer internally, of a peculiar and specific nature. It appears to me manifest, that the familiar employment of these terms *irregular* and *anomalous* gives an unbounded latitude to call every disease and every morbid sympathy occurring in a gouty individual a *disguised gout*." This warning is not uncalled for when we remember "that fools rush in where angels fear to tread" and that the shallow confident mind will only see gout in the malady of a gouty person no matter what it is. The force of habit is strong. A case rises up in my mind where a girl who was liable to subacute rheumatism was treated for such in a hospital, when time showed that there was suppuration in the intramuscular planes of the muscles above the knee; but the real nature of the malady was only recognised when the mischief was so advanced as to entail amputation. Pains and thought are required to recognise gout; whether positively or negatively. Scudamore goes on sarcastically—"A name being so readily found for an obscure disease, the practitioner considers himself as excused from the difficult task of nicer discrimination." And "nice discrimination" is often required to decide how far any malady in a gouty person is gout, or something else; and also how far the "something else" may not be influenced by the gouty diathesis, or cachexia as the case may be. A case obtrudes itself upon the consciousness which occurred long ago, when the writer was in general practice; an elderly

man, hale and healthy, dropped a flag (stone) upon his great toe. The bruised toe instead of healing kindly as might have been expected, took on acute inflammation, became much swollen and intensely painful; being very bad in the night. At first the nature of the malady was not recognised; but the inflammation did not go on to anything sinister, and soon it was clear it was gout, and the inflammation subsided after a time. There had been no enlargement of the joint previous to the injury; but no doubt there had existed some slight infiltration of urate of soda into the tissues, but not sufficient to attract the attention of the patient. Such acute gout from injury is a well recognised clinical fact; though not so generally known as the opposite fact that gout, like rheumatism, often settles upon a part which has been subjected to injury, and takes up its abode permanently at that spot. Or gout may be excited by severe exertion, and is liable, at first, to be taken for a sprain. Sprain and gout are difficult matters to decide sometimes; for first there is a true sprain, but the existence of urate of soda in the tissues causes the inflammation to become truly gouty, and the sprain passes on to an attack of acute gout.

If such are the difficulties connected with the well-recognised articular gout, what then are those of visceral gout of which Budd writes—"Pathological anatomy has done nothing for gout of the viscera; no effects of gout upon the pericardium or on the internal membrane of the heart are recorded. Gouty inflammation of the stomach is not questionable, and is often fatal; yet we possess no good description of its morbid anatomy." It is clear, then, that for

much of what is very important in gout we have to look for further information; rather than to careful clinical observation of the living, than to post-mortem examinations of the dead.

It may now be well to proceed with those features of gout which are intimately connected with its recognition; or in other words, its diagnosis.

First and foremost come the changes in the joints.

These are thickened and irregular in outline during the quiescent stage. The deposit of urate of soda in the tissues alters the outline. We have seen before (p. 8) how far accidental circumstances determine the local deposit as strain upon the great toe, or injuries to the knuckles of the hand. The phalanges of the fingers may be implicated and the articulations deformed; while the character of the skin is not without an element of instruction. Often the skin is thin, transparent, and looks as if it would run water if pricked; or it is pallid and opaque. Then in looking at the joint affected it is well to bear in mind that a certain wasting will follow disease from ankylosis. Consequently the natural appearance is altered considerably even when the deposit of urate of soda is small; and the enlargement or thickening of some tissues exaggerated by the wasting of other tissues. The great toe may not be altered in colour even when considerable deformity is present. Then the knee joint is altered. There may be some thickening or tuberosity; and there may be, with this, some synovial effusion. Or the bursa may be distended with fluid, especially at the knee and elbow; and deposits of urate of soda are not infrequent at the elbow. Suppuration may

occur in affected joints, but this is comparatively a rare implication. When it occurs it often gives relief from other gouty manifestations; and on its healing up attacks of gout may again develop themselves. When a gouty joint becomes the seat of acute inflammation the skin is tense and glistens. The redness varies from a blush to a deep red hue, as if mortification were setting in. The superficial veins are swollen over, and around the seat of inflammation. In a case of acute gout in the hand, set up by injury, the radial artery was thick, large, and could be rolled under the finger, like a soft cord; contrasting with the hard tendon-like feel of the artery of the other hand. Sharp subjective sensations accompany these changes, and the pain is intense. The time when this attack comes on is notably the small hours of the morning. The patient goes to bed, perhaps without feeling at all amiss, and awakens with acute pain in the ball of the great toe, and on examining it the significant blush is seen. There may or may not, as the case may be, have been any premonitions of the attack. There may have been, and they may not have been noticed; especially is this the case in a first attack. Or there may have been disturbances previously thereto, as altered action of the heart, feelings in the head, or dyspeptic symptoms; all of which are usually relieved by the local outbreak at the toe. So constant is the relief afforded that a century ago an attack of gout at the great toe was hailed with delight by those who were ill; such attack of gout being regarded as a cure for all ills. The pain varies. It comes on suddenly, not rarely to disappear as suddenly. At other times it continues for days, causing the greatest suffering. Often the

pain is much relieved on the appearance of œdema; just as the pain of toothache often passes away as the face swells. Or when many articulations are implicated the subsidence of the inflammation in one area is found with its development in another. Such metastases testify to gout being a general and not a local affection. The swelling of the joint (great toe) passes away in time leaving only the the deformity remaining; and then the cuticle peels off. In other cases where several joints have been implicated with synovial effusion the wrinkled cuticle is shed in sheets. As regards the permanent condition of the joints, attack after attack may pass over the great toe without extensive alteration of the form of the tissues; but in time the change is unmistakable even to a casual observer. The amount of deformity, however, produced by gout varies much in different individuals.

The hands during the acute attacks are stiff, and look like rigid objects, and feel very useless. Indeed the subjective condition of a sufferer from widespread gout is that of utter helplessness, most trying to the self-pride.

It would, however, simply be impossible to describe the infinite variations of articular gout: nor would such detail be so instructive as to warrant it. The thing is to know gout when it is seen; and then the special manifestation matters comparatively little. The wrists and ankles may be the seat of the gouty paroxysm; but this is infinitely less frequent than is the case with the phalanges. The shoulder and hip are less frequently affected than the knee and elbow. At times the jaw is the part in which the acute gout settles.

Then the sheaths of the tendons are affected. Notably in those cases where a finger is drawn down. The ring finger is very commonly the one involved. The tendon rises from the palm: and, from adhesions, there is often some puckering of the skin over it. A like condition, less marked, is to be found in the same tendon of the other hand. The sheaths of other tendons, as at the back of the hand, may be involved, or those of the feet, may be affected; and the sensation is as if the tendons moved stiffly within their sheaths, some resistance being offered to their normal easy sliding. There is some secretion into the sheaths of tendons, Scudamore holds, "and hence arise the thickened knotty feel of gouty tendons, their hardness, contraction and rigidity." The ligaments becoming similarly changed; while small bursæ may be converted into hard, solid tumours. Or gouty inflammation may affect the aponeurotic portions of muscles; just as the chordæ tendinæ and the muscoli papillares of the heart are matted together in other cases.

Muscles themselves are not modified by gout. "The muscular tissue is never primitively affected with gout. When a joint has been a long time ankylosed, the muscles which formerly moved it dwindle for want of use; and the texture of muscles may suffer much damage in consequence of repeated gouty inflammation of their aponeuroses." (Budd).

Nevertheless there are muscular disturbances in gout. Lumbago may not be one, truly; the muscular structure not being the part affected; but rather the attachments of the muscle, and the covering or sheath of the erector spinæ.

But so far as lumbago is a muscular affection it is not uncommonly found as a form of gout; lasting some time and passing slowly away like other gouty affections of fibrous structures. But lumbago of a rheumatic character may show itself in a gouty person. Mr. Spencer Wells (who wrote a little treatise on gout, long before he became a famous ovariologist), tells of a case where a gouty man caught a cold:—"He felt rather chilly before he went home, had a severe shivering fit in the night, and was confined to his bed for twelve days with a smart attack of acute rheumatism affecting the knees, shoulders, and loins; but not any of the joints which had previously been affected by gout." This shows that gouty persons may have other ailments, apparently quite disassociated from the gout itself. But at other times the lumbago is gouty, I think.

Cramp has always been observed as linked with gout. Scudamore thinks nine in twelve gouty persons so affected, not only before and in gouty paroxysms, but in the intervals. "The muscles situated in the thigh and leg are the most frequently affected; but those which move the toes and fingers, the diaphragm, the muscles of the chest, the abdomen and even the ribs, are not spared in the painful affection." The pain so occasioned is often very intense. "Cramp at the stomach" is set up in gouty persons by cold ingesta. Graves described "grinding of the teeth" as a symptom of gout. Garrod thinks that the grinding is rather the result of dyspepsia than of gout; nevertheless the cases were those of gouty individuals, according to Graves. Stiffness of muscles occurs sometimes; may be arising from the aponeurotic portion rather than the mus-

cular fibrillæ. At other times wasting of a group of muscles is not unknown : though how this is related to gout, in the present state of our knowledge it is not easy to say. Stiffness and inability to move the limb about to be affected with gout is common ; “ accompanied with shootings, numbness, prickings, and transient spasms ; ” but sometimes an opposite condition of “ increased energy and alertness ” may precede an attack, according to Scudamore. Cramp and startings of the limbs are common phenomena with gouty subjects. It will be urged, not without reason, that these manifestations are really nervous rather than muscular : and indicate irritation of motor nerve fibrils ; just as “ flashes of pain ” point to gouty irritation of sensory fibrils.

And now the morbid sensations of lithiasis, lithæmia, or gout may be reviewed with advantage. The pain of articular gout is intelligible enough from local causes. Pressure on sentient nerve fibrils is the cause ; aggravated by motion, and intensified by inflammation of the tissues infiltrated with urate of soda, increasing the pre-existing pressure. Twinges of pain are often experienced in joints before any tangible gouty inflammation is set up. These twinges correspond to the pains now under consideration. They are of two kinds “ flashes ” of pain ; and persistent exceedingly localised pain.

Some gouty persons, not only in acute attacks, but during quiescent intervals, will suddenly start and give the well-known “ hiss ” made by retracting the upper lip and drawing in the air sharply betwixt the front teeth, which seems the natural accompaniment of sharp pain coming

unexpectedly; and an enquiry elicits that a sharp flash of pain had passed over some portion of their skin, commonly the anterior aspect of the lower limbs. It is very sharp but transient; and resembles closely the "lightning pains" of locomotor ataxy. Such persons too will at times complain of sensitive areas of skin where the slightest touch, as the friction of their clothes will excite acute suffering. Graves has described these pains as gouty, and it would seem correctly, according to my experience.

Instantaneous impressions of heat or cold on limited areas are also linked with gout. Local anæsthesia, especially in the limbs, has been found by Da Costa to be an outcome of lithæmia, though not a very common one.

Far different in character, if not in associations are the "localised spots of pain" found with gout poison, and perhaps in certain forms of "liver-disturbance"; any how with the presence in excess in the system of nitrogenised waste. The best known of these are "painful spots" at the lower inner edge of the scapulæ. One authority looks wise and says "kidneys"; another looks wiser and oracularly exclaims "liver." It depends upon the inward eye! If one connects urine solids with the excretory organ he will conclude "kidneys"; if another associates them with the organ in which they are formed, he will naturally infer "liver." Indeed neither is wrong; but the evidence preponderates in favour of "liver" being the more correct term to employ in these "spots of pain;" which the sufferers commonly tell one they can "cover with the thumb-end." The next favourite locality to my mind is a spot over the pectoralis major muscle, to the inside of the

mamma. Such pain suggests something amiss with the heart, because it is regionally near it. The heart may be affected; but the two have no relation to each other; except that gout is the cause of both. Such pain being relegated to the heart causes the sufferer to consult his medical man about his heart; just as women with intercostal neuralgia, feel anxious about their hearts. These "spots of pain," are allied in character to the "shoulder-tip pain" well-known in connection with the liver.

Then sometimes the spot of pain, especially when felt in the sternal aponeurosis of the pectoral muscle, suggests the idea of angina pectoris. Indeed angina pectoris is common in gouty persons, as we shall see shortly.

Then true neuralgiæ may be gouty. Neuralgiæ in early life and with women especially, are linked with anæmia. "Pain is the prayer of a nerve for healthy blood" wrote Romborg, with much accuracy of observation as well as felicitousness of expression. So in advanced life neuralgiæ are apt to be due to the presence of gout poison in the blood. Sciatica is undoubtedly a "gouty" as well as a "rheumatic" affection. It has its tender spots along it; just as intercostal neuralgia has its "tender spots of Valleix." The pain of sciatica distinguishes it from pains which simulate it. "The pain is more or less steady, but it has its periods of fierce exacerbation; and damp, cold and pressure augment it. Pressure on localised points always develops pain, and the points that are the more marked are on the lower end of the sacrum, on the side of the trochanter opposite the emergence of the great and small sciatic nerves, various points on the posterior aspect of the

thigh, one at the head of the fibula, and one behind the outer ankle" (Da Costa). Irritation of the nerve is the cause of the pain felt in these cases; but this may go on to effusion within the sheath of the nerve, and then the aspect of the sciatica varies somewhat, and the acute features pass like a dissolving view into those which rather belong to a chronic affection. "If thickening or effusion be present, there is then not only local pain, but numbness and partial paralysis of the limb, as the natural characteristic results of the pressure on the nerve. The nerve being compressed, its function is impaired, and the symptoms alluded to necessarily ensue. Hence, when a patient who is suffering from sciatica complains of *a dull aching and a benumbing pain in the limb causing it to feel swollen*, when the sense of numbness and increased bulk has succeeded to a pain of greater intensity, accompanied by cramps and starting of the limb; and when more especially, in addition to these symptoms, there is more or less inability to move the limb—inability arising from loss of power, and not as a result of excessive pain—pressure on the nerve may be inferred" (Fuller). The same authority is of opinion that when the patient is "stout, florid, and a free liver, taking little exercise and sleeping much, or plagued with heartburn, acid eructations and occasional lowness of spirits, or has previously suffered from gout, his malady is certainly of gouty origin."

That sciatica is of gouty origin at times is generally admitted; but the gouty associations of other neuralgias are not so well known. Yet neuralgia of the temple is certainly linked with gout; and the supra-orbital nerve often

suffers. The characters of neuralgic pain pointed out by Anstie, are (1) its gustiness ; (2) its one-sidedness, unless when very pronounced, when it becomes bilateral ; (3) its being aggravated by anything that lowers the system ; and (4) its improvement by anything that affects the system beneficially.

Fat, iron, and phosphorus, constitute the treatment of anæmic neuralgia ; what the treatment of lithæmic neuralgia should be will be seen further on in its appropriate place.

This somewhat full consideration of neuralgia in connection with gout is necessary, in order to introduce properly an aspect of gout hitherto too little attended to by the profession at large ; but which I propose to consider at some length. I do not however wish, in doing so, to lay myself open to the charge of writing in a sensational manner, urged against me by a critic who ought to have known better, in the *London Medical Record*, for August, 1881, when the subject of Heart Starvation (see pp. 80-84, Part I.) was under review ; as I do not so write, so far as I know ! Nor am I at all thin-skinned about criticism. The critic's stab is useful in so far that it sometimes directs the author's attention to, and gives him the benefit of, an aspect of his work which he himself never suspected : and the side-light so thrown may bring out a shadow not seen in a full light. So in this case ! I desire to draw attention to the relations of gout to nervous phenomena, mental as well as bodily, and—as I do not desire the reader to be carried away with the impression, either suggested by the handling of the subject or by the insinuations of others,

that my views are singular and too individualised for acceptance—I will resort to some quotations from various authorities.

Sydenham writes:—"But this is also added to the Heap of his Sorrows, *viz.* :—That during the Fit, his mind is as it were affected with the Contagion, and so suffers with the Body, that it is hard to say, which of them is most afflicted; for every Fit may be as properly called a Fit of Anger, as of the Gout; for the Mind and Reason are so extremely enervated by the infirm Body, that they are so disordered by the least Motion of the Affections; so that he is as troublesome to others as to himself; Moreover, he is as obnoxious to the rest of the Passions, *viz.*, to Fear, Care, and other of the same kind, by which he is also vexed, till the Disease going off, the Mind also has recovered its former Tranquillity."

Scudamore puts it both ways; both as to the mental conditions which favour the development of gout; and the effect of gout upon the mind.

"The influence of the passions on the bodily health, we know to be at all times powerful; but as respects the gout, I think the depressing passions have the strongest effect. Grief and anxiety impair the healthy energy of the brain, primarily; and affect the digestive functions, the circulation and secretion of the liver, and the actions of the intestinal canal, in a secondary manner; thereby, in a gouty diathesis, predisposing to the disease. Again:—"Distress of mind acts powerfully in keeping up the symptoms of chronic gout. I have seen very strong proofs of this fact; so that, in some constitutions, while the feelings

are anxiously and much affected, it is truly difficult to accomplish a cure."

Again:—"Although in most of the instances related by authors, the strong passions have rather had the credit of *curing* than the reproach of *causing* the gout; yet we may believe that, on some occasions, they will serve to excite a paroxysm. One patient informs me, that some of his worst fits have immediately succeeded a violent irritation of temper; and in other examples, some mental shock has been quoted as the cause of an attack. In such cases we may consider that the system is at the time in a state of great readiness to take on the disease; the nerves are morbidly susceptible to a high degree; and the temper is more irritable. In the fit itself, an irritability of disposition is almost proverbial with every author." He then quotes Van Swieten,—"*I had long an intimate friendship with a person of very great learning, and otherwise of a sweet, peaceable and mild disposition, who taught by his experience, could at last foretell when he was to have a fit, by his being peevish a little before, and out of humour at every trifle.*"

Then as to the effect of gout upon the nervous system, he writes:—"The nervous system is often appraised of the approaching gout by previous general lassitude, with much agitation of mind, palpitation of the heart, or of the aorta, in some part of its course, but especially in the epigastric region; tremors, and internal flutterings. Sometimes the patient going to bed with no expectation of the approaching evil, sleeps through the night, but is distressed with some horrid dream; and in the morning finds that the demon of his vision has been the gout."

Todd has seen another aspect of the effects of gout-poison upon the mental operations. "Men of the gouty habit are often very hypochondriacal, and will sometimes betray a degree of weakness of feeling and temper nearly approaching a state of hysteria. And women, who in general are much less subject to gout than men, exhibit, when of the gouty temperament, great proneness to hysterical paroxysms."

Gairdner writes:—"But it is on the nervous system that the atonic gout makes its deepest impression. The patient is the victim of every kind of vague and inexplicable suffering; pain is the least part of his distress: there is a general sense of uneasiness sometimes referred to one part, sometimes to another, without constancy, regularity or rule, which keeps him in continued alarm. He takes the gravest view of the situation, and, when his physician can detect no sign indicating the least risk, he prepares himself for some sudden attack of dangerous disease, and talks to his friends of his approaching death. But though pain is a small part of his complaint it is often considerable. Hemisrania or megrims beset him; pains of the scalp and occiput torment him; stitches in the side, and difficulty of breathing simulating the distress of true asthma, or bronchitis, with copious mucous expectoration, afflict him; and these symptoms often go on for a great length of time without proceeding to any local indication of the disease, which is really the cause of the disturbance; so as to leave it a matter of conjecture and probability that the whole is to be referred to the influence of latent gout on the system." He then gives two instances of gout

affecting the mind ; in one there was "the most miserable hypochondriacism," the other was "the victim of the deepest gloom." After which he writes:—"These are two striking examples of the form of atonic gout which afflicts the mind. But there is every degree of this affection from the gentlest solicitude about health to the deepest despondency. Women are often, and particularly about the period when menstruation ceases, the victims of this form of gout. It is then accompanied by hysteria. Unfortunately, it induces them to seclude themselves, and in retirement they grow worse."

Dr. Hood says:—"The cerebral functions are sometimes seriously, at other times slightly, affected in gouty persons. Optical delusions, mental phantasms, and perversion of ideas are also met with in a few cases, and may be ascribed to the influence on the brain of the vitiated blood. From what we know of the blood in gouty persons, we may almost wonder that the cerebral functions are not more frequently disturbed in such a manner. The hypochondriasis of the gouty is less often characterised by delusions than similar disease when unconnected with gout, but the depression attending it is as great or even greater than if delusions were present. The individual has no special grievance upon which to dwell, but anything connected with him is viewed as 'through a glass darkly.' Besides the concomitant disorders that recur in persons who have been the subjects of acute gout, we may find many patients who suffer, even for years, from the various protean symptoms which are connected with the gouty diathesis, and who yet have never had a gouty paroxysm."

Da Costa gives a nervousness tending to hysteria, with sleeplessness, sensitiveness to sounds, great susceptibility to odours, as among "the nervous symptoms of lithæmia." Garrod gives "hysteria and hypochondriasis, headache, epilepsy, apoplexy, and mania," among the outcomes of gout. Epilepsy has been relieved by attacks of articular gout. He writes:—"In connection with this subject, I may state, that during attacks of epilepsy, paralysis, and apoplexy, in persons not known to have had gout, I have examined the blood and found it to be rich in uric acid."* He has also seen spinal symptoms relieved by articular gout. Of course sufferers from disease of the spinal cord may have gout; the explanation, he thinks, of some cases given by Graves of gout where the spinal cord was found softened after death."

At the recent International Medical Congress, Dr. Rayner, of Hanwell, read a paper on "gouty insanity." His conclusions were:—" (1). Protracted gouty toxæmia, when not very intense, usually results in sensory hallucinations, or melancholia. (2). Sudden and intense toxæmia results in mania or epilepsy. (3). Intense and protracted toxæmia usually results in general paralysis.† (4). If there is a tendency to vascular degeneration from plumbism, alcoholism, &c., varying degrees of dementia are produced."

I venture to think that these quotations will clear me

* This he thinks due to the shock given to the nervous system affecting the kidneys.

† This is interesting in connection with what is said about the analogy of the gouty kidney and the changes in the brain in general paralysis, pp. 65.

of any charge which may be preferred against me of writing in an alarmist or sensational manner, when I come to speak of my own views of the nervous relations of gout. In the *Gouty Heart* is written:—‘The mental manifestations are of great interest. In the first stage, that of high arterial tension, the brain works well under the high blood-pressure, and the mental processes are active and vigorous. But with this there is a certain amount of irritability and explosiveness of temper. The irascibility of persons suffering under an attack of acute gout is well known. Even when there is no articular gout present, the temper is apt to be impaired when the blood is unusually charged with gout-poison. And this, perhaps, is the most constantly present of all the indications and symptoms of a gouty state of the blood. The annoyance caused by small trifles is out of all proportion to the exciting causes. The patient is conscious of this state of irascibility which adds to the irritability.’

Such is the condition when high arterial tension, good nutrition, and high functional activity of the brain exist, with great muscular power. Active enterprising people are those well-nourished possessors, or claimants of gout for years and years, their gout perhaps shewing itself now and again in some outward form; or settling down on heart and arteries, without any indications to excite alarm, until distinct mischief has been done. But in time the scene changes, and as the nutrition fails, or the gout deteriorates the patient’s physique, the brain becomes less able and more irritable. The temper is excitable and uncontrollable; paroxysms of anger alternate with intervals of gloom;

the patient is morbidly anxious about his, or her health, or harassed with needless worries about others or their affairs; fidgetty and querulous, and very liable to the "fidgets," especially on getting too warm in bed, or in warm rooms:* indeed, these are the evidences of an imperfect blood-supply to the brain blended with the irritability set up by excess of uric acid. Such persons often are great trials to themselves as well as to all around them. When it is understood that all is due to "suppressed gout" then allowances are made; but too frequently the condition is uncharitably ascribed to "pure cursedness" and resented accordingly. This is often very unfair. "There are our varying dispositions which not even grace can alter" and if good-tempered and good-natured people become unfavourably affected by gout-poison in their brains, what may be expected from those that are neither, those who live with them can tell? Peter Featherstone in *Middlemarch* is a case in point. The ill-grained old churl was trying enough in his best days; but when heart and kidney disease flooded his brain with uric acid, he became what George Eliot has sketched him. The sketch is no caricature and is true to life. But allowances must be made: the brain can no more do its work properly and smoothly, when poisoned with uric acid, than the patient can have an elastic tread with a gouty foot. The perversity and "cantankerousness" form a gouty phase of mind, gout in the brain indeed; and the recording angel will probably

* The late Prof. Laycock pointed out the high temperature of the gouty with their high arterial tension, and how they enjoyed becoming cool under circumstances little attractive to others.

make a note to that effect for a plea of "extenuating circumstances" at the last Assize. Years ago I wrote:—It seems possible to charge some mental actions, otherwise inexplicable and unaccountable, to retained urine salts, and especially to uric acid, a conclusion perhaps more acceptable to charity than likely to be accepted by psychologists. It would often be satisfactory and agreeable to explain anomalous and indefensible acts by this theory, and lay some of human frailty to the charge of uric acid." (*The Heart and its Diseases*. First edit., 1872).

A proper comprehension of these psychical aspects of gout is worth the possessing. Not only does it impress, as it is right it should, the patient that the medical man understands the case before him; but it enables the medical man to sympathise more with the subjective state of the patient, and so to comfort him or her, as well as to advise them more wisely. Indeed, an insight into the patient's mental state is most desirable in all cases; and the mental state is often strong corroboration of the diagnosis. Of course the mental state varies with different individuals, and with the same individual at different times, what is known as "moods." Now in gouty persons the "moods" are accentuated, and too frequently in the direction of apprehensions, dreads, vague fears, or irritability with irascibility and explosiveness of temper. A person in fear of coming evil is rarely amiable!

Such then are the effects of gout-poison upon the cerebro-spinal system and the mental processes. But there are other phenomena of neurosial character to be considered. Scudamore speaks of a cough connected with

gout. He does not attempt to describe the character of the cough, whether loud or otherwise. He says:—"I have repeatedly seen instances of this kind, in which the patient and his friends have been alarmed for the safety of the lungs; but the cough has entirely yielded to the treatment best adapted to the threatening symptoms of gout." Gairdner also notes "chronic cough" among the indications of gout.

Disturbance of the action of the heart is widely recognised as a symptom of suppressed gout. Palpitation, irregular action, and feebleness, are the prominent symptoms. All authors have noticed this relation of gout; so it is unnecessary to make quotations in support of my own experience. Gouty palpitation is recognized by the main fact that this palpitation is not induced by effort, but comes on at other times. Of course when the heart is weak then effort will induce palpitation, as it will in others who have a feeble heart. Then there is irregularity of action, amounting to intermittency, in some cases associated with gout. But the most alarming case for the patient and his friends is that where the pulse becomes all but imperceptible, the patient is confined to bed, and feels as if the heart was about to stop for ever. Here there is a condition suddenly developed which does indeed suggest failure of the heart's action. Gairdner relates a case where for several years the patient "was subject to occasional attacks of faintness, without manifest cause, and generally in the midst of more than ordinary comfort. The attacks were at long intervals of weeks, and sometimes of months. They lasted only a few minutes, and

after an hour's rest he was not conscious of remaining disorder. There was no sign of tendency to the head. On the contrary the pulse was suppressed, and the countenance sunk and pallid. Very repeatedly his case was patiently and minutely investigated by Dr. Bright and myself. We could not detect the least abnormal sound in the pulsations of the heart, nor any other evidence of disease of that organ. His father was much subject to gout, and died suddenly, at advanced age, of supposed metastasis of the disease to the heart. All his brothers suffered from it, and even his sisters are supposed to owe delicate health to a gouty temperament. Taking the whole case into consideration, Dr. Bright and I concurred in opinion that there was no sign of disorganization of the heart, and that it was one of suppressed gout." Attacks of swooning came on in a journey to the North. In Edinburgh he consulted Dr. Charles Bell, "who also found the heart free from suspicion of altered structure." He pursued his journey. One day feeling very well, "he took his gun and amused himself with shooting for several hours. On his return to the house he was met by one of his servants, to whom he expressed considerable suffering, and complained particularly of pain at his heart. A moment afterwards he fell to the ground, and appeared, even to the servant close at hand, to have died instantly. The body was not opened." This is a very interesting case. Did there exist some fatty degeneration; and the heart temporarily weakened by the exertion and consequent demand upon it, succumb thereto? Or was the last only a more severe attack of syncope than the preceding attacks? If

so, what induced the syncope? Was it heart-failure, set up by sharp arteriole spasm, due to a gouty state of the blood? A possible explanation. Or was the syncope set up by some gouty irritation, either directly, or indirectly, through some other nerve-centre of the inhibitory fibres of the vagus? * This also is possible. Indeed to my mind it seems the most probable. His attacks came on under circumstances which render the view of fatty degeneration untenable, for they were not associated with exertion, which would be the case with a fatty heart; but "in the midst of more than ordinary comfort." Yet he died after exertion. It seems most probable that the irritation acting through the inhibitory fibres of the vagus, was sufficient to bring the heart to partial standstill in diastole producing syncope, and that this recurred from time to time. At last the blow came when the heart was more or less exhausted: and then the arrest was sufficiently prolonged to be fatal—no long time either. Such is the view which seems most compatible with the facts of the case—the recorded facts; and the medical men were all competent observers. It is such attacks of temporary arrest, not complete, but partial, which are most alarming to the patient and his friends. In a case seen recently, the patient was confined to bed with most unpleasant sensa-

* The vagus is a rope of several strands. It contains inhibitory fibres and reflex inhibitory fibres, "those in which the heart is brought to a standstill in diastole, as when the intestine is struck sharply with a knife (Goltz). Such probably is the explanation of the instant death which follows a severe blow on the pit of the stomach. Through these inhibitory fibres, fainting from severe emotion, injury, or shock, is brought about." ("The Heart and its Diseases.")

tions at the heart, until the great toe became inflamed, and then relief was at once given to the heart symptoms.

This question of gout producing imperfect syncope, and even more enduring diminution of the heart's energy, is one of great interest. The effect upon the inhibitory fibres of the vagus seems to furnish the most feasible explanation of the different phenomena; for fainting is not a common occurrence in advanced life without such evidences of heart impairment as would fairly account for it. Imperfect angina is quite common; well marked angina much less frequent in gouty persons. But this is not angina so much as the effect of the inhibitory fibres of the vagus. Sometimes there may be one, sometimes the other, in action: perhaps in the same case at different times. Thus Dr. Gairdner, whose observations of this aspect of gout are of remarkable value, writes:—"I have observed that the first sign of disturbed health which has attracted my attention and announced to me a tendency to gout, has been disorder of the heart's action. When I have had an opportunity of observing the health of any one, previously to a first attack of gout, or have had a patient who could make an observation on himself, I have rarely, if ever, found the disorder wanting. Its most common form is that of palpitation, fluttering, pause in the heart's action, intermission, or some indication of diminished tone and energy—in a word, impaired power of the organ. These symptoms are often experienced in so slight a manner that they escape the patient's notice." Such interruptions to the rhythm of the heart stand in a very suggestive relation to the vertigo so commonly found amongst the subjects of

gout and lithæmia ; where there is no question of failure of the muscular walls of the heart. We have seen that the walls of the arterioles are thickened, especially as to their muscular coats in lithæmia, and that variations of their calibre is due to spasm ; and this may affect the vessels within the encephalon, of the cerebrum, or maybe the cerebellum (and then the spasmodic contractions will lead to vertigo) and produce syncope. Nevertheless, and admitting this, there seem good grounds for holding that the inhibitory fibres of the vagus play a part in the phenomena of gout. May not gout at the stomach be such irritation of the gastric fibres as acts reflexly upon the cardiac fibres of the vagus, producing syncope with coldness of the extremities ; or even fatal syncope. There seems much to countenance such a view. We are just beginning to "see through a glass darkly" some of these relations of reflex syncopal conditions. Palpitation as the result of irritation in other viscera, as a displaced uterus, or a sensitive ovary, we are beginning to know familiarly. Reflex vomiting as an evidence of a calculus of the kidney has long been recognized. Reflex inhibition of the heart is now dawning upon us. Some time ago a medical man, until recently of unusual vigour, consulted me about his heart. His pulse grew very slow and feeble at times, and he had to sit down till the attack went off. This had gone on till he was quite unfitted for exertion. Examination of the heart said it was a good, sound, vigorous heart. It was pretty clear that the case was one of arrested action through the inhibitory fibres of the vagus, due to irritation "somewhere." He complained of pain betwixt the sca-

pulæ about their middle. As he had seen several medical men before with negative results ; I thought it well to investigate the spinal phenomena along with some authority on the nervous system, so took him to Dr. Ferrier. He walked slowly, almost painfully, the short distance to Dr. Ferrier's house. It is not necessary here to go over Dr. Ferrier's examination of him, but his diagnosis was :— "some inflammatory thickening of the spinal meninges," a conclusion with which I quite agreed ; and suggested some local treatment. This was the "irritation somewhere," to my mind, reflexly affecting the heart. The patient felt greatly comforted, and has since gone on capitally. He writes me :—"On the whole I have been much better, though varying from time to time ; have followed no particular treatment." He then explains a domestic circumstance which tasked his strength, after which he continues :—"In my moments of rest I have been surprised at the fatigue and exertion (such as lifting) I have gone through the last five weeks. I have not suffered any cardiac symptoms worth mentioning. My pulse has a much fuller character. I have not taken the frequency, no faintness having occurred." Since this he has gone on steadily improving in all respects.

Now it seems to me that gout-poison irritating some part of the nervous system, possibly not rarely some part of the sympathetic in the abdomen, as the great plexuses, may affect the heart reflexly, and inhibit its action. I say the great plexuses of the sympathetic, because we all know how a blow over the pit of the stomach will prostrate a man, or even kill him outright ; so much so that such a

blow "below the belt" was debarred by the rules of the prize-ring. We know that abdominal pain will produce sickness, faintness, and vomiting; and also any injury to that portion of the peritoneum which becomes the tunica vaginalis.

Norman Chevers, in his work on the *Medical Jurisprudence of India*, tells how death is produced by compression of the testicles. When two men are fighting, the wife of one will get behind her husband's antagonist, and grasping his testicles, will put him *hors de combat*, or even kill him if the pressure be sufficient. Indeed, we are beginning to realise the fact, that just as palpitation of the heart may be set up by irritation acting reflexly through the sympathetic nerve; so we may have arrest of the heart's action set up reflexly through the inhibitory fibres of the vagus. Such conditions are naturally alarming, and suggest the idea of organic disease. As a better knowledge of physiology—that is, that physiology which throws light upon questions of practical medicine—extends through the profession, such cases will be diagnosed correctly; which will be a good thing for the profession as well as the patients. Such reflex irritation as the cause of the failure of the heart, is rendered the more probable the more the subject is examined.

Gairdner has also noticed "hiccough" as a symptom of gout in connection with vomiting, and other gastric symptoms. Where there is persisting gastrodynia hiccough is common. "Very obstinate hiccup is a frequent attendant of this form of gout. I have seen it distress patients by day and night, without any intermission, for a great length

of time. It often comes on after a sudden suppression of the discharge of urea and urates by the kidneys, and I consider it an unequivocal sign of approaching death." Certain it is, persisting hiccough is always held to be of bad omen (and here probably indicates the oncome of uræmia); though I have seen it pass away along with some other grave symptoms. When hiccough is found with gout, there is either some direct irritation of the fibres of the phrenic nerves; or there is some irritation elsewhere affecting them reflexly; or there may be a slight peritonitis travelling over different viscera, as the stomach, when there is vomiting; or the under surface of the diaphragm, when there is hiccough. The two may co-exist. Such a case I recently saw in Hampshire in an old gentleman, who recovered from all his gout-symptoms, to die of shock from an accident. The whole subject is a most interesting one; but much more observation is required to clear it up.

Another nervous phenomenon closely connected with gout is angina pectoris, or "breast pang." Not a very frequent disease in its fully developed form; but common enough in an imperfect form. From the observations of Lauder Brunton and others, the pathology of angina pectoris is arteriole spasm; by which the blood-pressure in the arteries is so raised that the left ventricle falters, and cannot force the blood contained in it, into the aorta on systole. The aorta being still so full that the high arterial pressure prevents the ingress of the blood contained in the left ventricle, and then angina follows. In this arteriole spasm, the vessels of the coronary circulation take part in

complete angina. The heart-muscle is so deprived of its nutritive supply, and then the heart becomes acutely distended; and this condition of distension, when pronounced, gives rise to the acute suffering. Frequently there is this same condition of high arterial pressure with attacks of palpitation, or violent contraction of the heart to overcome the distension.

It is necessary to be clear about this matter. High arterial tension will give rise to a condition of distension of the left ventricle, the escape of blood from it on systole being hindered.

This distension of the ventricle gives rise in turn to:—

(1.) Palpitation to overcome the distension; or

(2.) Angina, when the distension of the muscular fibre of the heart-wall is pronounced.

Palpitation is a very common phenomenon in gout. The arteriole spasm which is so common with excess of nitrogenised waste in the blood, is the cause thereof; and as arteriole spasm is common, so is palpitation. Gouty palpitation consequently is not linked with effort, but comes on at other times. When palpitation is due to impaired energy in the heart-walls, in other words to muscular failure, then it is evoked by effort which taxes the heart. When effort is made, no matter of what kind, then palpitation tells that the heart is taxed. Gouty palpitation has other associations; may come on when the patient is sitting quietly, or even when in bed. But when the gouty person has a weak heart—as, for instance, in corpulent ladies at the change of life with atonic gout—then, of course, effort taxes the weak heart, and they

have the palpitation of muscular failure. But they also have true gouty palpitation due to arteriole spasm coming on at other times. This is a plain, clear exposition of the relations of gouty palpitation to the state of the heart.

Angina is also an outcome of this high arterial tension due to arteriole spasm. Here the heart-muscle becomes distended, and does not contract vigorously, or, in other words, palpitates. A gouty person may have palpitation at one time and angina at another, according to passing conditions of the heart-muscle. When the distension is great, then much terrible suffering is entailed before the spasm relaxes and the heart can recover itself. When a condition of fatty degeneration of the heart-wall is established, then such time of acute distension is fraught with imminent danger to life. The decayed muscular fibre is so distended that it fails to recover itself; and then the patient dies with the heart in diastole and distended with blood. This is sometimes spoken of as "asystole"—want of systole, or contraction. The prognosis of angina pectoris turns on the state of the heart-wall: when the muscle is sound the danger is small: when the muscle is decayed the danger is very great indeed.

Angina pectoris is at times a neurosal affection. Usually it is comparatively easy to determine the real nature of the malady. The neurosal form is mainly found in women, not of the gouty type. Though this is not always the case; still neurosal angina has different relations from those of gouty angina. The following case was one of the most complex which has come under my

notice:—"This patient, a gentleman of forty-two, who had lived well, had begun to suffer from recurring attacks of angina, which were readily induced by exercise. He could not say how many attacks he might have had. There was hypertrophy of the left ventricle with a loud aortic second sound, and a faint systolic whiff heard at the base of the heart at intervals. The urine contained deposits, and he felt a good deal of irritability at times. The pain in the attacks shot out at the occiput and shoulder-blades, as well as the finger ends, when the attack was severe. The patient also had *tic convulsif*, or blepharospasm, on one side of the face. Some difficulty was experienced in determining the nature of the angina. The condition of the heart gave the malady a gouty aspect. The twitching of the muscles made it look neurosal. The medical gentleman who brought the patient had observed that the pulse became hard and incompressible during the attack, resuming its normal form as the pain vanished. This settled the question of arteriole spasm. The patient was put upon a non-nitrogenised dietary, and recommended to keep quiet. He was ordered some bicarbonate of potash, with small doses of strychnia and digitalis. The attacks passed away gradually, the pulse became softer, and the heart sounds quieter. The patient felt much relieved. The tic was also improving. Probably it also was of gouty origin." The after-history of this case would be most interesting: but, despite all my efforts, no trace of the patient can be recovered. As it is, the case is full of instruction. Imperfect angina is quite commonly found with gouty associations.

The condition of the arteriole walls in gout (p. 43) would favour such spasm locally as well as generally. Ischuria renalis, suppression of urine, is found with close spasm of the renal arteries. It is linked with granular kidney and lithæmia. Vertigo, from spasm of the arterioles of the head, of the cerebrum, and probably the cerebellum, is common in gout. Da Costa says of lithæmic vertigo, "It is a giddiness frequently repeated: often there are several attacks daily for a few days, and then there is a much longer interval: it may occur at night. It happens irrespective of exertion, although long-continued fatigue, especially in reading and writing, excites it: so does mental worry. But anything that aggravates or induces the lithæmic state develops it most promptly." This vertigo is not that of Meniere's disease, nor yet of eye disturbance. It is the vertigo of want of blood in the cerebrum, or rather cerebellum, such as is experienced by climbing a steep stair, when the heart fails to maintain the blood pressure in the encephalon: or that of arrested heart action spoken of before (p. 100): or that experienced by some persons when the weather becomes warm and the blood-pressure is lowered, and the blood-current in the sinuous vertebral arteries is slowed. The relations of vertigo to gout are very interesting. It lies along the same line of arteriole spasm which gives palpitation; angina, closely linked with gout; and ischuria renalis less commonly seen.

Another phenomenon linked with gout is "nocturnal dyspnoea." Of course nocturnal dyspnoea is found with the congestion of the lungs and distension of the right

ventricle, so frequently seen with a mitral lesion. That is a well-known form. But there is another form of dyspnoea to which I have drawn attention elsewhere (*Chronic Bronchitis*, p. 100). It is a less serious form of dyspnoea, not sufficiently discriminated from the other in our text-books, nor even special treatises. To understand it we must think about the cause of the inspiratory act. As the carbonic acid accumulates in the blood, it stimulates the discharging centre in the medulla oblongata to send out an efferent message to the respiratory muscles to draw in air. This new air ventilates the residual air in the thorax, and the chemical interchanges (the taking up of oxygen and the giving off of carbonic acid) go on properly. The rhythmic act of the respiration is so carried on. If we try to hold our breath we can only do so for a very limited time, even with the Eastern pearl diver, and then the accumulation of carbonic acid in the respiratory centre sets up an inspiration to purify the residual air in the chest. This inspiration it is in drowning persons which fills their air-tubes with water. Now when we fall asleep, the act of breathing becomes slower and deeper, *i.e.* the rhythm varies. In gouty persons the respiratory centre is apt to be overcome in sleep, perhaps the uric acid has some narcotising effect upon it; anyhow the carbonic acid accumulates in their blood during sleep, and then they waken up with dyspnoea, or rather a series of extensive respiratory efforts.

The excess of carbonic acid is got rid of by these deep inspirations, and soon a normal condition is restored, and the patient drops asleep again, comparatively readily.

Now this dyspnoea from accumulation of carbonic acid in the blood, with a series of deep inspirations to restore matters, is quite a different affair from the nocturnal dyspnoea of distension of the right side of the heart. In the first the dyspnoea is soon relieved; in the latter it is more persistent, indeed the condition is a more serious one altogether.

There is something very interesting in the effects of gout poison upon the circulation, and the respiratory centre; albeit we yet know so little compared to what we hope to know, ere long, on this subject.

Gouty persons are exceedingly liable to bronchitis. The acute attack gives place to a chronic rheum, often of acid mucus, with emphysema as a consequence of the laboured respiratory efforts necessitated by the malady. The acute attack has nothing peculiar about it, or differentiating it from acute bronchitis in others, except the features of gout. It is important to recognise the gouty factor in the case, for the treatment both of the acute and chronic stage. Then, when the mucous membrane has been transformed into an excretory organ casting out uric acid, as there is every reason to believe is the case, the treatment of the bronchitis becomes the treatment of the gouty state, on which the chronic affection depends. This, however, will be more fully considered in the chapter on treatment. But the emphysema remains. The lung-tissue, no longer so young and so elastic as was once the case, is distended or even torn, so that air-vesicle is opened into air-vesicle, and thus a condition of "broken wind" is established. The distended vesicles do

not recover themselves, as is the case after acute bronchitis in young persons; and of course for the ruptured vesicles nothing can be done, so the patient remains permanently emphysematous. Nor must the reader be carried away by the impression that emphysema necessarily involves a barrel-shaped chest, else he will often be misled. The barrel-shaped chest of emphysema is characteristic enough; but emphysema, and extensive emphysema too, can exist without such modification of the chest-walls, and examination will soon tell of its presence. The heart dulness is lost, or very largely lost, while the liver dulness is not detected till the edge of the ribs is reached. These are safe guides for beginners, but the percussion note is altered elsewhere as well. Such emphysema is no proof of gout in itself, but it often helps to corroborate the diagnosis, as it leads to imperfect oxygenation.

So much for the thoracic complications of gout. Pleurodynia, or dry pleurisy is not uncommon in gouty persons; but it possesses no distinguishing features in the gouty. Pericarditis and pleurisy are both found in acute uræmic conditions; but with these we are not engaged at present. Pain along the insertions of the diaphragm is, I am inclined to think, linked with gout. The pain felt through the chest at times may be gout of the aponeurotic portion of the diaphragm; but my observations are not yet sufficiently numerous to enable me to speak positively on the subject.

Now we can consider the abdominal relations of gout. Dyspepsia is a common concomitant of gout, especially in

its atonic form. Gout at the stomach was once a complication sorely dreaded; now less, or even little heard of. In plethoric gout dyspepsia is out of the question. Often if the patient could only be rendered dyspeptic it would be the best thing that could happen to him; for dyspepsia would relieve him from the consequences of too much good living. ("I have been a dyspeptic for fifty years" said an old clergyman. "Thank God, for it!" All his brothers had died of gout.) But the appetite and the digestion too frequently remain unimpaired long after the liver has acquired the vice of forming uric acid in excess; perhaps from too great demand upon it in the metabolism of albuminoids taken in excess of the body's needs. Acidity with heartburn is, however, found at times in the full-fed plethoric gouty person, possibly from the uric acid finding its way into the gastric secretion. But when a gouty cachexia has been developed, then symptoms of dyspepsia show themselves. "It most commonly happens, that the patient is severely dyspeptic, and that the stomach is distressed with various uneasy sensations. A craving desire of food, and nausea, are often felt alternately. Oppression after an incautious meal, and flatulent distension, attend the gouty dyspepsia in an urgent degree; and to this may be added *heart-burn*; or, in some individuals, a coldness at the stomach of a peculiar nature and intensity, compared occasionally to that of marble, or even of ice. Fugitive spasms affect the muscles of the abdomen, or ribs; or cramps occur, which are of some distressing continuance. In many examples in which the appetite seems natural, the patient has not the feeling of benefit

from his diet; and when this is of too stimulating a kind, the irritation produced by local uneasiness grows into feverish action. An exceeding irritability marks the temper. The mind is hypochondriacal, imaginary evils disturb the judgment, and shake the resolution on trifling occasions. Palpitations affect the heart; and the sensations spoken of as flutterings are still more frequent. Either from pain or uneasiness, the sleep is disturbed and unrefreshing." (Scudamore.)* There is a great distinction to be drawn between well-fed gout with a good digestion, where the brain and other organs are well-supplied with blood, rich in nutritive material, even if there be an excess of uric acid present; and atonic gout, where uric acid is formed, but where there is little normal digestion, and the various tissues are badly fed. In the latter case the patient is obviously in the worse plight of the two; there is no doubt about that. Nor will liberal supplies of nutritive food, highly azotised, make him strong under these circumstances. When such a scheme is tried, all the symptoms are aggravated, for the food is not transformed into proper albumen of the liquor sanguinis; while the liver, still more taxed by the new demand upon it, makes more uric acid. Often the loss of appetite is nature's plan of giving the liver physiological rest; but then when a person is very weak—"It seems so sad that

* Sleep broken and unrefreshing is common with the gouty. Even when there is no pain they "cannot catch sleep." It eludes them for hours. Far into morning they fall asleep, and awaken irritable, and without the feeling of having rested. This wakefulness seems linked with the presence of uric acid, and a high arterial pressure; both aggravated when an attack of gout is threatening.

they cannot have something to improve their appetite, and then they might get stronger!" Certainly if good wishes could effect a cure the patient would get well. But a certain place, the goal of the wicked, is said to be paved with good intentions. Again and again the evil results of injudicious feeding under these circumstances come under the physician's notice. The loss of appetite should be studied; not assumed without thought to be baneful, nor attacked without discretion. To give albuminoids to be dissolved in the gastro-intestinal canal, and so reach the portal vein, when the power of the liver to further deal with them is largely lost, is foolish and does harm. An instance of this was furnished some time ago in the person of a well-known medical man, the father of another better-known medical man (who died of gouty disease of the aortic valves). The old gentleman was saturated with gout. On a dietary of farinaceous matters, milk puddings, &c., which he scornfully called "pigs-victuals," he was fairly well and comfortable. But the palate remained good, unfortunately for him. A dish of oysters, pork sausages, a turkey, or ducks, were all right, and partaken of freely when the opportunity offered, as too frequently was the case—with the result of attacks of acute indigestion, and vomiting, at grave times; much discomfort and a load of white lithates in the urine in a few hours, at less aggravated times. This was merely an instance that knowledge does not always inspire conduct, as it might fairly have been expected to do—under these circumstances at least.

These are the cases where the *Revalenta Arabica* suits so

well. It does not tempt the palate to excess, while caseine-albuminoids tax the liver less, and go wrong less in their later metabolism in the digestive act, than other albuminoids. But then the other viands are so much more tempting! Certainly: and if much human frailty can be laid to the charge of uric acid; much avoidable uric acid can be laid to the charge of human frailty, and to weakness in moments of temptation.

Then, when the gouty cachexia is formed, the most remarkable change is in the function of the stomach. The appetite becomes more capricious; it is greatly impaired for all the simpler kinds of foods, and seeks the stimulus of condiments and dainty dishes. Even with their aid, and often because of their aid, the patient endures much from flatus, acidity, cardialgia, and spasmodic pain of the stomach; but these obvious evils are less than those which reveal themselves to the eye of the physician. The comminuting and dissolving, which Dr. Prout has named the reducing power, is much impaired. Many kinds of wholesome food seem to defy the action of the gastric juice, pass into the bowels in a solid state, and may be detected, after having undergone small change, in the excrements. It is probable that the fluid articles of food also do not pass through the requisite process, though this can be less readily ascertained. "The consequence is not only great irritation in the bowels, but deficient nourishment of the whole frame. It might naturally be expected that the heart, which so readily shares in the disorders of the stomach, should exhibit signs of suffering, but the functional disturbance of the heart transcends

anything which can be explained by the sympathy of neighbouring organs. Though the patient suffers much when the stomach is replenished with food, his complaints are hardly less when it is empty. Formerly, when his digestion was rapid, he was able to pass many hours without food, he now feels faintness and failure if not frequently supplied with it, and craves the assistance of cordials to defend himself against the sensation of exhaustion" (Gairdner). The digestion is so imperfect that little pabulum from a meal reaches the systemic blood, and consequently the patient must eat often from exhaustion, while the bye-products of digestion are considerable and exercise a toxic influence. Sometimes the patient says that shortly after a good meal he or she feels well, but in a little longer time the morbid feelings show themselves, *i.e.*, that the first products of digestion are normal and feed the blood, and so they feel well; but soon this ceases, and mal-products or bye-products are formed which exercise a malign influence upon them. Under such circumstances no wonder if they require food at brief intervals,—and cordials too! As to the heart associations there are several points to be looked at. (1) The stomach lies regionally near the heart, the thin aponeurotic portion of the diaphragm alone intervening, so that any flatus, formed therein, by its elastic pressure compresses the heart and so incommodes it. (2) That irritation of the gastric fibres of the vagus may affect the heart reflexly through the cardiac fibres of the nerve, either (*a*) inhibitory producing depression, or (*b*) acceleration producing excited action; or (3) the bye-products

or mal-products may irritate the arterioles, producing contraction of their muscular coats, and, with that, a rise of arterial pressure which may embarrass the heart. The disturbances of the heart found along with dyspepsia, or maybe much aepsia in the subjects of atonic gout, are not difficult to comprehend; and anything which soothes the stomach is good for the heart.

Metastases of gout to the internal organs do undoubtedly occur at times, and produce alarming symptoms. "The other supposed varieties of irregular gout are, for the most part, only forms of the atonic disease, and it is this which constitutes their great danger. When, owing to feebleness of constitution, the gout declares itself in one of the great viscera of the body, or is removed from the limbs to the stomach, heart, or other great central organ, in consequence of exhaustion, there can be little doubt of the serious risk of the patient. If the stomach be the part selected for attack, it commonly announces itself by sudden and violent spasm, or what is called cramp. This is accompanied by a great sense of heat, sickness and vomiting, hiccup and faintness. The vomiting consists at first of mucus and serous matters, which, unless relief be given, become darker, till they assume the colour and consistence of the well-known coffee-ground discharge, which is not unfrequently mixed with copious ejections of blood." Such is the description of "gout at the stomach" as given by Gairdner, and it tallies with accounts I have received from numerous observant old family practitioners; for it is under their notice rather than of the consultants such attacks come.

Very serious alarming attacks they are too. No doubt acute indigestion from a meal of unsuitable materials closely simulates such attacks. Vomiting in the one case is calculated to give relief, speedy and effectual, and the voiding of the irritant material ends the attack. But when the case is truly one of gout at the stomach, then the vomiting goes on, first the contents of the stomach, then mucus and serous matters, then the coffee-ground vomit, from minute ecchymoses of the mucous membrane; and, finally, hæmorrhages of fluid blood, after which the patient sinks. Such is an acute attack of gout on the stomach, death being due to exhaustion often before the loss of blood is sufficient to sink the patient.

Then there is a more chronic condition of gastro-intestinal derangement due to the state of the mucous membrane. It is quite common for a gouty patient to complain of acridity, or acidity, or morbid sensations of taste, and for the mucous membrane of the *primæ viæ* to be unhealthy, as seen by the tongue and fauces. There is hawking cough, often with some viscid phlegm from the pharynx, just as there may be some acid phlegm in the trachea coughed up on rising in the morning, from the uric acid irritating the mucous membrane. There are too, uncomfortable sensations in the bowels, and often a relaxed state of the vessels at the anus. Consequently piles are common among gouty patients; they may, or may not be bleeding piles. When they are, the bleeding often gives great relief to the local congestion. Indeed the patient rather looks forward with delight than apprehension to some bleeding from the bowel. Itching

in the anal orifice is also a common phenomenon when the digestive organs are upset; and with the gout there is apt also to be some eczema about the anus. At other times there are fissures, or relaxation of the mucous lining of the rectum, requiring surgical treatment.

Enteritis may be set up by gout retroceding to the vitals. Garrod quotes such a case from Dr. Home; and gives another which occurred under his own observation. A subject of established gout was recovering from an articular attack when he was exposed to cold. Abdominal symptoms showed themselves, the pulse grew feebler and feebler, and the patient sank. On post-mortem examination, eighteen inches of the ileus were found intensely inflamed. The rest of the organs were healthy. "It was evidently a case of enteritis, and, in all probability, of a gouty nature."

The next system to be considered is one especially associated with gout, and that is the urinary system. Uric acid rhombs, urates of soda and ammonia, gravel and calculus, renal or cystic, are all closely linked with gout. Acute renal conditions present definite semeia; but are there any local evidences of chronic renal disease furnished by the kidneys themselves? So far as I have been able to discover, either from medical literature or clinical observation, chronic renal disease furnishes no local evidence of its existence; except when there are calculi in the kidney. But the symptoms of renal calculus do not attach themselves to interstitial nephritis, the growth of connective tissue in the organs, which is the essential pathological change in the cirrhotic,

contracted, or gouty kidney. "Pain in the kidneys is a patient's account of himself; and aching over the loins is complained of by gouty persons; but not at all commonly. There is no such relation between the comparative rarity of such complaint, and the frequency with which the kidneys are affected in gout. One is compelled then to write that the local evidences of chronic renal change are nil, or at least negative."

When a calculus is in the kidney, then "the pain often extends along the course of the ureter to the testicle, which is retracted and swollen. Not unfrequently there is also tenderness on pressure over the affected kidney, and the pain is greatly increased by active exercise; and it is not uncommon to find, associated with these exacerbations of pain, nausea and vomiting, and the appearance of blood in the urine" (Da Costa). Local pain and tenderness are then found with renal calculi. When, however, the calculus has passed from the pelvis of the kidney into the trumpet-shaped infundibulum of the ureter, and the pressure of the urine behind forces the stone into the narrow channel of the ureter, then a definite series of symptoms are set up; a series with which the practitioner will do well to make himself intimately familiar. For nephritic colic comes on, like other colic, without any warning. The case, too, may be something of this kind. A gentleman, a perfect stranger to the medical man, arrives at a neighbouring house, after a considerable journey, and in a little time thereafter is seized with acute agony. Everybody is dreadfully alarmed, the doctor is sent for hurriedly, and by the

time he sees the patient, finds him in anything but a desirable condition for precise examination ; while those around are nearly distracted with the emergency and the violence of the suffering manifested, and earnestly entreat the doctor to tell them what is the matter, and what he thinks of the case, without allowing him time for a proper examination. His face is eagerly scanned to see what is in his mind ; and he finds it is much easier to hold his tongue than to keep his muscles of expression under command. He finds the ordeal a trying one ; all the more that probably a messenger has been sent off post haste, for the nearest local consultant. He must make no mistake this time ! He feels that ; and yet, unless he knows what he is about, he is very likely to do so. Still nephritic colic has distinct features. "Nephritic irritation displays symptoms peculiar and diagnostic. If it sometimes causes spasmodic pain shooting down the thigh on the affected side, just as in a case of sciatica ; it, at least, gives perfectly significant tokens of its true *nature* and *source*. It is accompanied by pain in the course of the ureter, and by painful retraction of the testicles, with pain shooting down to the tip of the penis, and a frequent desire to pass water" (Fuller). There is a clear group of symptoms, (1) pain shooting from the loin to the groin, and down the genito-crural nerve to the testicle and down the thigh. The pain is severe, like passing a gall-stone ; sickening, as pain in the abdomen usually is. (2) Great prostration with pallor, and a small radial pulse ; (3) coming on with the acute pain, in a person previously well. If there have

been a preceding attack, the patient knows what is the matter with him, if the doctor should be in some doubt. After the stone has passed the ureter and slips into the bladder, the patient gets relief. Aching over the loins, with sense of fulness, and uneasiness is found when the kidneys are the seat of some acute congestion from gout. There are weight and dragging towards the bladder, and the urine is scanty and high coloured. Then there is often great irritability along the urethra. "A remarkable irritability of the bladder and urethra, with increasing secretion in the mucous membrane of these parts, prevails with some persons shortly before the fit; and when the urethra is affected with stricture, these symptoms almost with certainty take place" (Scudamore). Gouty urethritis, simulating gonorrhœa, is a not uncommon phenomenon. It is relieved by articular gout. As to urethræ which are already the seat of stricture, Sir Everard Home, wrote:—"So much is the urethra, in its natural state, under the influence of gout, that it is sometimes affected by it in the coming on of every attack with all the symptoms of inflammation; as pain in making water, and a purulent discharge; and as soon as gout fixes itself in the foot, they entirely disappear." When any disease exists along the canal, the effects of gout are apt to be severely felt in the urethra. Scudamore says, that, "with the exception of the discharge I have seen persons affected, in a very remarkable degree, with inflammatory and spasmodic irritation of the urethra shortly before the fit: and with them this occurrence has been a sure presage of the gout which was to follow."

It is not, however, invariably the case that gouty persons with stricture, suffer from urethral gout. Cystitis may occur with gout, as an acute form or manifestation of it. Smarting of the urethra, or scalding by the dense concentrated urine, is quite a common complaint of gouty persons. When the urethra is the seat of old standing disease it is very liable to be affected with gout. The prostate gland is often enlarged in old gouty subjects, and it seems too to be at times the actual seat of gout. Soudamore writes:—"In two patients I have seen that chronic inflammation of the prostate gland has been so curiously modified by the gouty diathesis, that the surgeon has pronounced the gland to be affected with gout."

On the other hand a profuse emission of lithates often gives great and immediate relief to many gouty symptoms. Indeed Prout goes so far as to say—"Whoever has attended much to urinary diseases, must have remarked that many individuals, subject to derangements of their general health, seldom feel so well with respect to their health, as when lithic acid deposits take place in their urine. This circumstance is, perhaps, most strikingly exemplified by those attacks of gravel which are apt to commence about the middle period of life in gouty individuals. Thus, we frequently find that patients who had previously for months, or even for years, been subject to various anomalous affections, and pains in different parts of the body, accompanied by great derangements of the assimilative functions, will suddenly obtain relief from the whole by a discharge of lithic acid gravel, or, perhaps, of a small lithic acid

calculus from the kidney." Whatever irritation the passage of lithic acid and urates may cause to the urinary organs, it is clearly much better that the peccant matter be ejected from the system, rather than that it should remain working mischief somewhere; even though the persistent excretion of forms of imperfect metabolism in the liver does in time lead to interstitial nephritis. The practical aspect of the subject is this. When uric acid and urates are so passed, to diet the patient so as to produce the minimum of the irritant matter; using such regimen and medicinal agents as may further this end. For when the gout-poison is thus rendered apparent to the eye, even the most sceptical will probably admit the gouty character of the case.

At times, too, there is great vesical irritability, even with a urine of high specific gravity, which is usually well borne (Sir Henry Thompson). The sleep is often much broken by the repeated calls to empty the bladder. Sometimes in these cases there is a certain amount of catarrh of the bladder. This phenomenon may occur in either sex. In males this *ardor urinæ* leads to a sexual ardor at times, despite the agony which is being experienced. In females the concentrated urine is apt to produce great irritation of the labiæ; almost as much as is occasioned by sugar in the urine.

Such are the various manifestations of gout affecting the trunk and viscera. There are some other forms of gout remaining to be reviewed.

One of these is gout of the eye. This does not involve those retinal changes found in albuminuria, and associated

with renal disease, which have been spoken of elsewhere. The gouty affections are sclerotitis, iritis, and conjunctivitis. These maladies do not, so far as I can ascertain by inquiry, research, or observation, present any peculiarities by which they may be recognized as being of gouty nature. Garrod sums up thus—"Patients having a well marked gouty diathesis now and then experience attacks of inflammation in different structures of the eye; and it is important to bear in mind the fact that the state of the habit considerably modifies and keeps up such affections; and also that treatment directed to the gouty condition of the system proves very effectual in curing the local disorder." In other words, in order to diagnose correctly gouty affections of the eye, it is necessary to be able to recognize the gouty individual. And this holds equally good of the treatment.

The same is the case with gouty affections of the skin. So far as I can make out, these affections when gouty have no special characteristics. There is neither an intense itching nor a peculiarly sharp pain about them in many cases, though certainly in some; consequently again it is the diagnosis of the individual. Eczema is certainly often gouty; and is common with articular gout, as well as cases of dyspeptic gout in individuals of the neurosical temperament. Herpes I have often seen with lithæmia or lithiasis, even when few gouty symptoms were present. Then psoriasis of the palms of the hands and the soles of the feet is not rare. It often gives rise to a suspicion of old syphilis, and undoubtedly is often so associated. The well-born scion who becomes gouty as he grows older is likely to

have had syphilis in his earlier years. Sydenham points out this—"In those who are obnoxious to this Disease, they being either worn out by Age, or having by Intemperance hastened old Age, the animal Spirits are decayed throughout the whole Body, being consumed by the immoderate Use of the vigorous Functions in the Heat of Youth. For Instance, by too early, or too much use of Venery." While Scudamore puts down as a cause of gout *nimia veneris*, adding, "Voluptuous passions and the excesses of the table go hand in hand:" and quotes the Greek couplet to the effect that "Gout is the daughter of limb-relaxing Bacchus and Venus." Hippocrates held eunuchs to be free from gout. Consequently the product is a blend of gout and syphilis; and gouty psoriasis of the palm is objectionable because it may have a specific history; and is even more objectionable when it is free therefrom, and there is not "the sweet consciousness of guilt." Prurigo is certainly gouty in its associations very often; especially prurigo of the anus, or the vulva. Itching of the skin, as pointed out before (p. 40) is found with an excess of nitrogenized matter in the blood; whether in jaundice (bile) or lithæmia. Prurigo of the anus is often relieved, as might be conjectured, by bleeding from a pile. Pityriasis and acne are also associated with gouty condition. Scudamore says—"Erythema and urticaria may be mentioned among the incidental complaints of gouty persons," and thinks that they arise from a faulty state of the stomach and bowels.

As to the skin itself it is modified in appearance by gout. In some, usually the plethoric, it is glistening and

oleaginous. In others it is opaque, as if infiltrated with something which destroys its transparency. While in some cases it seems of abnormal thinness and transparency; and if a subcutaneous syringe be used presents little obstacle to the entrance of the needle. One portion of the skin is very apt to become affected in gout, especially when linked with glycosuria, and that is the fold of the prepuce, which is liable to become fissured, or cracked under the circumstances.

The superficial veins in the gouty are liable to become prominent and swollen; and that, too, when the arteries are tight and full of blood. It would seem, indeed, that there is too much blood in some gouty persons; too "full-blooded" was not an inaccurate expression, if old-fashioned, in speaking of plethoric gout. This fulness of the veins is most marked in the limbs which are the seat of gout. Speaking of acute gout, Gairdner says—"One of the most remarkable local symptoms is the state of the superficial cutaneous veins leading from the affected part. They are uniformly enlarged and turgid with blood, no matter what part of the body may be assailed, and this sometimes to such a degree as to give them a varicose appearance." That is, that a permanent condition of venous fulness is aggravated when a gouty paroxysm is threatening. The saphena vein is felt hard when the foot is affected. Scudamore points out that—"In urgent and continued gout, the veins of the whole limb are preternaturally distended with blood, and when contrasted with the healthy limb, present the appearance of universal fulness. The state of the

veins is most remarkable in the leg, but in the arm it is also very distinct."

In connection with the veins, allow me to draw the reader's attention to what Garrod says as to actual inflammation of the veins in gout. He says that phlebitis is developed occasionally and is found under two sets of circumstances—"First, when acute gouty inflammation attacks the veins of a part affected at the time with gouty inflammation; and, secondly, when phlebitis, usually of a much less acute character, ensues without the previous development of gouty inflammation in the neighbourhood of the part." Sir James Paget regards phlebitis as linked with gout, and even as being hereditary in certain families. In one case, a pulmonary embolism occurring from phlebitis was due to a severe attack of gout. Some little time ago a patient of my own had cedema with gout, who had been a hard liver, especially as to alcohol for some years. He quite recovered, then caught cold with the result of pneumonia of the right base; this was clearing up when the cedema returned. This in turn was disappearing, when some phlebitis showed itself in the extremities. His heart was not very weak, though he was seriously ill, and one day he walked from one room to another, his nurse turned to attend to the window; on hearing a curious noise, she turned round, and found him choking and black in the face, and before any alarm could be raised, he was dead. This case was not, in my opinion, one of heart failure, but of pulmonary embolism. Such a complication should not be lost sight of in cases of gout in debilitated or worn-out persons, with or without cedema.

Then as to the arteries. The atheromatous process is a part of the cardio-vascular changes of gout. The arteries are not only tense, but their coats are liable to grow hard. Consequently the radial artery may be like a tendon (as Dickenson puts it), or hard and tortuous. The temporal artery is often conspicuous, being thickened and tortuous, and can be seen to be elongated as well as widened on systole, in some cases, even where there is not disease in the aortic valves. When there is aortic regurgitation the pulsations are readily observed. Often the condition of the temporal artery will excite a suspicion as to what is the matter with a patient even when there is no apparent connection betwixt the state of the artery and the matter complained of. The coexistence of an arcus-senilis is often corroborative of the diagnosis. One outcome of the altered condition of the arteries is senile gangrene. This is due to the occlusion of the arterial lumen by the atheromatous affection of the tunica intima, and loss of elasticity in the arteries. In some cases of calcareous degeneration of the arteries the arteries feel like pipe stems. When an amputation is inevitable these brittle arteries break to pieces under the ligature in a manner very provoking to the surgeon. These arterial changes are found with fatty degeneration of the heart, and are common with the subjects of chronic gout.

Deafness as a gouty disease is well recognized. Gouty patients are liable to metastases of maladies from one part to the articulations, from the articulations to the vitals. Whenever such metastatic phenomena are manifested the probability of gout is very strong. Even

erysipelas Scudamore has seen "to represent or come instead of the gouty fit." Certainly there are cases, especially where the skin is thin, spoken of at p. 126, where recurrent erythema, or erysipelas is common; there the patients are mostly ladies; and exposure to an east wind will set up an erysipelatous state of the face. In one case known to me, such attacks alternated with severe paroxysms of muco-enteritis, ending in some copious purging with much prostration.

Very suspicious indeed are these, or any other recurrent maladies in ladies beyond the menopause, who present the lineaments of gout; and still more if they suffered severely at the menstrual periods for some time before the menopause was reached. Gouty dysmenorrhœa, with or without menorrhagia, is undoubtedly a distinct form of female trouble. Nor is the menorrhagia improbable when we reflect upon the plethoric fulness of the vascular system in some cases.

There are three associations of gout still to be mentioned in connection with its diagnosis. The first is the susceptibility of gouty persons to opium and mercury. That in cases of gouty kidney these two remedies must be given with caution is now well known. That certain other gouty patients may take one or both of these drugs, not only without mischance but with positive advantage, does not affect the fact that others are very susceptible to these two agents. Sir Charles Scudamore knew this well. He gives a case of a gentleman "who in three days took a quantity not exceeding six grains of calomel in divided doses at bedtime, in conjunction with small

doses of opium, while the bowels were daily acted upon by purgative medicine, a very severe salivation took place, attended with high fever and irritation. The gout, which had almost quitted him, and had declined in the most favourable manner, was re-excited, and became more painful, intractable, and tedious than almost any case which I remember to have seen." He gives two other cases where gout was "consequent" upon the use of mercury, and concludes: "That gouty persons in general are more easily affected by mercury than others." The same holds good of James's powder in some cases. He says of opium, "Experience shews us that the effect of opium very usually tends to keep the secreting function of the kidney, when it is under inflammatory irritation, in further restraint, even although it be used in combination with purgatives." Upon this general principle, therefore, the internal use of this medicine must be matter for consideration. This effect of opium upon the kidney should, indeed, make its exhibition "a matter for consideration" whenever there is evidence of excess of uric acid in the system. Further it has the same "restraining" effect upon the liver, and embarrasses the action of that gland very much. From its effect upon the liver and kidneys, opium is contra-indicated in gouty affections. It has seemed to me, further, that the person who cannot tolerate opium is also intolerant of mercury, and *vice versâ*. Garrod holds that caution is necessary if the kidneys are affected; "in these cases mercurials, if given beyond the amount sufficient to act as hepatic alterants, may be productive of most injurious conse-

quences." Cullen and Sydenham avoided opium when it was possible, and Garrod writes: "My own experience has led me to form a similar opinion, and in the majority of gouty cases, unless the pain be very excessive, or there be fear that if not relieved the patient's nervous system will suffer, I always feel disposed to withhold their administration and trust to other means, as opiates tend so powerfully to diminish the secretions and augment congestion of the portal system." Of the reason here assigned I entreat all readers to take a note, as this applies to many cases, notably thoracic disease, when there is no gouty complication. As a broad rule, then, opium, and its derivatives, and mercurials in all forms are to be given with caution to gouty subjects. There are those who can take them without injury, but there is a large class with whom they seriously disagree; and as there exist no external means by which the two can be distinguished it is well to be wary. It should be made a rule absolute never to give either drug to a gouty person without at least inquiring sedulously as to what their experience of these agents has been in the past. And when patients state that either of these drugs disagrees with them, the medical man should be on his guard as to the existence of renal changes.

Musgrave, Huxham, Falconer, Parry and Todd all had noted the relations of lead to gout. Garrod found that one-fourth of his gouty patients at King's College Hospital had, at some period of their lives, been affected with lead. Painters and plumbers often become gouty. He found uric acid always and invariably in the blood in

lead-poisoning. From observation and experiment he thinks lead prevents the excretion of uric acid by the kidneys. He thinks lime too sometimes has a like effect.

The relations of gout to diabetes mellitus have been discussed before (p. 21). Then finally there is wakefulness to be considered in relation to gout. Sleep involves cerebral anæmia, and the high blood pressure in gouty persons often interferes with this. The patient is not in pain, but sleep will not be wooed. Hour after hour of wakefulness at last yields to a brief sleep in the later hours of the morning; and the patient arises irritable, weary from insufficient sleep, easily put out, and apprehensive of all manner of evil. Such complaint should always excite a suspicion of gout, though it may be set up by other blood-poisons, as oxalates; and by mal-products of secondary digestion in the liver.

Since writing the above a case of *angina pectoris*, of gouty associations, occurring with persisting dyspepsia, in a gentleman of high nervous organization, has drawn my attention to a passage in Scudamore; for the description fitted him in almost every particular. He had no articular troubles, yet all the medical men he had seen, though treating his stomach primarily, suspected gout. "When the stomach is the most affected part, the marks of indigestion are felt in the most sensible manner, by some or all of the following particulars—Heartburn; eructations which are sour, attended with a sense of heat, and often conveying the odour of yesterday's meal; a craving appetite, which does not become comfortably satisfied; oppression after a meal, with a painful sense of distension,

and soreness of the whole epigastric region. This sense of soreness is sometimes experienced in so extreme a degree, that only slight pressure from dress can be allowed, and even a gentle touch at the ensiform cartilage, or just below that part, is dreaded by the patient as an act of violence. Perhaps a very slight meal causes a sense of fulness and distressing oppression: the patient feels inflated, or, to use his own descriptive language *blown up*. This happens particularly if he partake with any freedom of vegetables. Sometimes, indeed, the smallest portion of vegetable disagrees in this manner. Such an irritability of the stomach prevails, that even much bodily exertion will bring on vomiting; and nausea and slight sickness are readily induced. The abdominal muscles are irritable and convey the feeling of great rigidity on examination. To this may be added, a furred tongue and clammy state of the mouth; with viscid saliva, which is experienced more especially in the first of the morning. Its taste is often remarkably saltish. There is troublesome thirst. In dyspeptic persons in whom the nervous system preponderates, the tongue is coated either with a white or yellowish-white fur; but in those of the sanguineous temperament the colour of the fur is deep brown; or brown mixed with white. In the former class of patients, the complexion of the tongue is very commonly pale; in the latter quite red." Such "dyspeptic persons in whom the nervous system preponderates" are often as truly gouty, that is, plagued with uric acid, as the most corpulent florid broad persons whose knuckles proclaim gout, and whose shoes present knobs corresponding to

their deformed great toes, whose articulations are sodden with urates.

Gout may be blended with some condition inherited or acquired, and here it may be well to make a quotation from Sir James Paget's recent Bradshawe Lecture: "We should look out for indications of the existence in the same person of two or more morbid conditions or dispositions, such as may be derived from both parents or several ancestors. For, as in plants and animals there are hybrids and mongrels, or as in chemistry many compounds and many mixtures, so are there in diseases. We see them in multiform and confused varieties of what we have to call rheumatic gout; in gout crossed with scrofula, and syphilis crossed or mingled with scrofula or with gout. It is often not difficult to discern some of these combinations among these cases; and I know few things in practice more useful than to be able, even in some instances, to adjust our treatment to the proportion of each disease in the compound. But we may be sure there is much more to be learnt in this direction; and it is best to believe that we rarely have to do with a simple and unmixed morbid constitution. There are few worse habits in practice than that of commonly saying of one case 'It is all gout,' and of another it is all scrofula or all syphilis. We might as well say [of any Englishman that he is all Norman, or all Anglo-Saxon, or all Celt. We may, indeed, sometimes see persons who appear to be as types of races unchanged in many centuries, but in practice we had better study every man as, for better or worse, a composite of many ancestors."

CHAPTER VI.

THE PROGNOSIS IN GOUT.

By the perusal of the preceding chapters the reader will be conversant with gout: (1) in its production; (2) in the changes wrought in the tissues, directly and indirectly by uric acid; and (3) the diagnosis of gout when encountered in practice. In connection with this last important matter, I have preferred to freely use quotations from other authorities in order to give the reader, as far as possible, a full, broad view of what our leading authorities have noted and put down on the subject, rather than utterances of my own.* Having grasped these different parts of the subject clearly; the other parts unfold themselves without difficulty. Certainly; but if the preceding chapters have not been "read, marked, learned and inwardly digested"—especially the last—then the reader will not see the rest so clearly; nor will the prognosis, and, still more, the prognosis modified by the treatment, be as easy as it would otherwise be. Nor is the prognosis an easy matter at any time. All the more reason then to try to make it as sound as circumstances will permit.

* I am aware that this practice has brought down on me the censure of some critics; but I prefer to continue it in what I conceive to be the interest of my readers—the main end of books in my opinion.

In the first place, then, it is well to inquire carefully into the patient's family history. First the father; then the father's brothers and sisters. Any gout? If that is admitted, there need be no cavil as to accepting the statement. Then if a negative answer be given—and sometimes a patient is as coy about admitting any gout in the family as a maiden is about owning that she has got a lover—ask after any rheumatism. Possibly this will be admitted, even when gout is denied. Then it is well to pursue the inquiry. What are the family ailments? Any dropsy? Any stroke? Any asthma? Those are all conditions closely linked with gout. Then any skin affections? Perhaps it will come out that one or more of the father's parents, or uncles or aunts, have suffered from some of these troubles. Then go carefully over the mother's side; glean any fact which may crop up. While doing so make clear what has been the duration of life on either side. It takes a great deal to kill an individual who belongs to a long lived family! The reader may smile at this: but the fact remains. After that, try to ascertain to which side the patient takes, or resembles. This is well worth ascertaining.

By this time something is positively known as to the family history—a matter of great importance when strangers are being dealt with. When the practitioner knows the family history he stands on grand vantage ground when it comes to the matter of prognosis. Next, proceed with the individual. Ascertain his past history; any ailments he or she may have had. Then the occupation or pursuit. It is readily seen that articular gout in

a strong, hale country squire, who otherwise is in superb health, carries with it a very much better prognosis than is the case where a pallid town-man, who spends far too much of his time in a badly ventilated office in the day, and in a close smoky room at night, with a suspicion of sherry in the one, and whisky and seltzer in the other—presents a puffy-looking finger. In the one there is genuine articular gout; in the other there is an approach to rheumatic gout, a tendency in a bad direction.

Then, of course, there is the question of internal complications. Is there any valvular mischief a-foot about the heart? Any atheroma setting in about the aortic arch?—In such a case the prognosis is dark, as this is the side of gout which is so fraught with danger. Valvular disease is not likely to be quiescent when associated with a high blood pressure in the arteries, evoking hypertrophy of the muscular walls of the heart. When such hypertrophy enables the ventricle to contract vigorously, to overcome the resistance offered by full arteries, the strain upon the valves must be increased hand in hand with the hypertrophy. Valvulitis under such circumstances, is certain to be progressive; albeit in some cases the rate of progress is slow. When there is a certain amount of dilatation in the hypertrophied wall, then a complex question has to be solved. Is the dilatation the result of a stealthy process of tissue-degeneration spreading gradually, bit by bit, through the muscular structure—"the fatty degeneration of failing hypertrophy;" where the dilating process can never be

arrested, but only slowed? Or is the dilatation the measure of the inability of the nutritive processes to arrest the dilating process of hypertrophy until a certain enlargement of the ventricular chamber has been established?—a condition common with women; and, if so, the prognosis is fairly good, at least, compared with the preceding form of dilatation with failing hypertrophy. The gout, so far as the distortion of the joints of the extremities goes, is free from any threatening of life; but its outcomes may endanger life most gravely.

Then, again, the state of the arteries is most important. If the arteries are hard with atheromatous change, then there is a distinct liability to apoplexy from rupture of an encephalic vessel; aneurysm from the rupture of a coat anywhere, but especially in the aorta; and angina pectoris. The last is of little prognostic import, however alarming, so long as the cardiac muscle is sound and undecayed; but when once a fatty necrosis has established itself amidst the fibrillæ, then angina pectoris is fraught with distinct danger to life.

In making an estimate of the value of the patient's life (from an insurance point of view), the *tout ensemble* of the case is the first matter. Next to feel the arteries, or to scrutinise the temporal artery, or both. Then to auscultate the heart carefully; for other methods of examining it are comparatively unimportant—ossified costal cartilages and emphysematous lungs interfering therewith. Then to compare the heart with the radial artery; ascertain if the pulse-wave at the wrist is delayed, or if all the waves reach the wrist. The first

will tell of arterial degeneration by hardening ; the latter of lack of energy in some of the ventricular contractions. Let the patient make a slight effort, see if this increases the number of defective pulse-waves.

Then examine the eyes for any arcus. Remember *arcus* is a bow ; *annulus* is a ring. The *arcus senilis* consists of a "bow" to be detected first under the upper eyelid ; then under the lower eyelid to a less extent ; finally a complete ring is formed. This arcus has a badly defined outline, the edges are blurred and indistinct, and the cornea is hazy and cloudy from minute granules of fat being developed throughout its structure. This tells of a process of fatty degeneration going on in the tissues of the cornea ; very likely to be accompanied by a like decay or degeneration in the structure of the heart and larger arteries. Such an arcus is distinct and easily differentiated from the calcareous arcus ; where an opaque white calcareous ring surrounds the cornea at its junction with the sclerotic, bearing a certain relation to the ring of bony plates at this tissue-junction in some birds. This ring is sharply defined, and accompanied by a perfectly clear limpid cornea. It grates a little when the ophthalmic surgeon's knife passes through it, when operating for cataract ; but otherwise is of no moment. When such a calcareous ring is seen, as it commonly is in the blue eye, it gives a curious bird-like expression to the gaze. This calcareous ring, conspicuous as it is, carries with it no prognostic importance, such as attaches itself to the other, the fatty arcus ; which obtrudes itself far less upon the consciousness of the observer. When

there is any suspicion of the existence of an arcus, it is well to lift the upper eyelid, and search for a faint, often badly marked, "bow." When found it is very significant.

Then there is, too, the question of the bulk of urine. When the blood-pressure within the arteries is high, the bulk of urine is increased. Consequently, so long as the cardiac hypertrophy is maintained unimpaired by tissue degeneration the bulk of urine is great. When the heart begins to fail the bulk of urine drops. When the patient states that the bulk of urine is distinctly less than it once was, the remark carries with it a deep suggestiveness. When a trace of albumen begins to show itself, the prospect is dark, and the vista does not extend far into the future.

Such then are the semeia of cardinal importance as to the cardio-vascular changes which form so important a part in gout—or in granular kidney, a term which may be more correct when there is no articular implication.

Then there is the gouty person of the neurosial type. Here there is commonly evidence of the nervous system suffering. But on this aspect of gout it is not possible to speak so confidently as could be wished, or as may fairly be done about the changes in the circulatory organs; because our knowledge of the subject is less complete. Any evidence of failure of the nervous system should be regarded as ominous. Headache is liable to increase as time goes on. Any impairment of any portion of the cerebro-spinal system should be carefully noted. If the patient have had a stroke it is very probable he, or she,

will have another. One stroke may leave behind it a softening area which will favour another rupture of an artery, which will plough backwards to the medulla, and by pressure on the respiratory centre promptly cut life short. If the patient have any cardiac change with hard arteries, then one stroke will probably ere long be followed by another; no matter whether it has arisen from arterial rupture, or from an embolism: the embolon being drifted from a cardiac valve, being either a portion of a vegetation or a tiny clot formed therein. Thrombosis, too, is found with gout. So any evidence of a past injury should raise great suspicion as to possible future mischief. Spells of unconsciousness are common with aortic stenosis. Any faintings should at once direct attention to the condition of the muscular portion of the heart.

Flashes of pain, anæsthesia, singing in the ears, or disturbances of vision, carry with them a certain significance, according to their associations. But recurring neuralgiæ, with or without herpes, is of bad prognostic omen. So is itching, whether of the skin generally or of the anus or vulva especially. Such perversions of sensation may be central rather than caused by peripheral irritation; or may be set up by disease bordering on the sentient afferent nerve fibrils; and in either case are suggestive. When truly peripheral they may show a strong tendency to remain; or, if removed by appropriate treatment, to recur. Whether peripheral, or not, they are not of good omen.

Then come some other matters, such as the effect of

heredity. Now it may be well to point out the fact, that in sundry cases where there has been a decided family history of gout, a youth has had an attack early in life; and then lived for many years without another seizure. But such experience is decidedly exceptional. Where it leads to the adoption of an anchorite's fare and abstinence from all fluids containing alcohol, then such attack may lead to the avoidance of the causes of gout; and so prevent the occurrence of another attack for years to come. But usually sooner or later the enemy reappears; and with every new manifestation tightens its grip. Many cases are known to me of comparatively young men who are gradually and steadily becoming the subjects of confirmed gout; and who have every prospect before them of being crippled with it long before old age is attained. Then again there are others, comparatively free from any family taint, who acquire gout by a sustained course of good living, who have their first attack when middle age is attained: this class has little prospect of freedom from future attacks. Probably it will be a case of "the further in the deeper" in most instances; though this rule has its exceptions too.

Then there are the cases where gout has followed upon some injury to the kidneys, so that the excretion of uric acid is interfered with. It is impossible to be dogmatic about a class of cases hitherto little noticed, and therefore not extensively observed nor recorded; but the impression on my mind is that in this class of case the gout hangs about the system, haunting it, ready to manifest itself on any provocation however slight; and only kept off by

watchfulness—the watchfulness of a cat watching a mouse, any forgetfulness bringing its punishment swiftly in its wake. In this class of case the utility of the daily use of the solvents of uric acid, viz., lithia and potash, taken first thing in the morning, seems most fraught with benefit.

Just in the same way when gout is fastening down on the articulations, any development interfering with locomotion is very bad. While the patient can take exercise, so long is it possible to keep the gout at arm's length; but when the feet become so crippled that the patient cannot get about, then the prospect is seriously clouded. The gout then closes on the system, and commits further and more extensive ravages. It is indeed scarcely possible to so diet or drug such patients as to prevent their becoming more and more the victims of their malady. When the hands are the seat of disease the patient is incapacitated for work if a handicraftsman; but the health may be little affected, and the patient can get about and take such exercise as is good for the general health. The coachman who drives a great deal and becomes the subject of gout in his hands has a bad prospect before him, as regards fitness for his vocation. Though he may live for years after he is rendered useless as a breadwinner. When such a man is florid, stout, or at least robust, and high-complexioned, then it is well to strongly advise total abstinence from all alcoholic drinks, especially malt liquors; and the greatest moderation in the use of meat. By such measures I have often seen gout threatening to become very serious put quite in abeyance for years.

Then there is another class who are subject to gout in their hands, viz., those who work amidst lead, as painters and plumbers. The lead seems to interfere with the elimination of the uric acid by the kidneys; and in that, or some other way, tends to fix the condition on the affected organism as "chronic." Here the avoidance of more fouling of the system by lead is very desirable.

In both these classes of cases the prognosis as to life is infinitely better than is the prospect of being able to labour. Many of the cases of gout seen in our infirmaries and sick asylums are cases where the patient is incapacitated from earning a living, rather than cases where danger to life is involved. Indeed, articular gout has in itself no danger to life; it is the inward complications which belong to it which involve the risk to life. But then there is a certain antagonism betwixt internal and external gout; and there are those, of whom the writer is one, who hold that the joints are far the safest localities for gout, as regards the duration of life. But to be a helpless cripple in a workhouse, or parochial infirmary is a dismal prospect for an artizan or labourer; nor is the prospect much better when the more affluent patient has to be confined to the armchair in the house, and the Bath chair for exercise—to exist a sentient but helpless cripple.

When the small joints of the hands are being infiltrated with urate of soda so as to be visibly enlarged, the prospect of improvement under any treatment is but small indeed. It is surprising, however, to what an extent such arthritis can go without the patient being incapacitated

from using the hand. The deformity sometimes reached is wonderful. Indeed, such depositing of the urate of soda keeps the system comparatively clear of the gout, and as such lessens the liability to internal mischief. Of course, it is not claimed that the free deposit of urate of soda in the articulations of the extremities necessarily prevents any like deposit in the cardiac valves. When the hand presents the large epiphyses of the strumous diathesis, and is at the same time the seat of chalk deposits, the prognosis is bad: the strumous being bad subjects for any chronic malady involving nutrition. The more the aspect of the affected hand is that of rheumatic gout the worse the prospect: the more it is true genuine gout, the better the outlook—though at the best it is not very encouraging.

And now a few words as to the recurrence of gout in an active form in affected articulations, may not be out of place. Scudamore writes:—"The pitting of the integuments on pressure, no pain being produced, is a favourable sign, as showing the removal of inflammation. Some weakness of the part is a natural consequence of the inflammation; but I think it a suspicious circumstance as to relapse, when a greater degree of weakness remains than can be reasonably accounted for. In proportion as the opposite circumstances are observed to take place, we have, according to my experience, the assurance of a tedious and difficult form of disease; and among the unfavourable signs, I consider the strongest to be, a quick transference of severe inflammation from one part to another, joined with painful sympathy of the stomach or

the heart; with irregular fever, and with exquisite sensibility of the whole nervous system. I must also add that, in every case in which the internal secretions fluctuate between the condition of health and disease, we should give a guarded prognosis as to the probable period of the recovery. Until I had acquired a considerable experience (that powerful corrective of the judgment) in the management of a severe gouty paroxysm, my expectations of an uninterrupted convalescence were sometimes sadly disappointed by a troublesome relapse. The chief grounds on which the prognosis is to be formed are, an attentive observation and accurate knowledge of the state of the respective secretions. When these are become *permanently* healthy; when all local complaint, except some weakness, has disappeared, and when in conjunction with such change the tranquillity of the nervous system is restored; we may look with confidence to the stability of the cure." Scudamore lays stress upon nervous symptoms as being of great prognostic importance. Now comes the other aspect of the subject, viz., the effect of mental worry in keeping up the gout in a limb. Not long after I had begun to give some especial attention to gout (about thirteen years ago) a medical man, now deceased, asked my opinion about a severe attack in his ankle. There was nothing about the joint, nor him, to indicate that the gout would not depart as in other cases; so a favourable opinion was given. But it was not verified; indeed, far from it. He, from no fault or want of foresight of his own, was involved deeply (for him) in a bankrupt Insurance Company, and no progress was made until the

affairs of the Company were settled, and with it the worry consequent thereupon. He came out considerably the poorer; but after this, his ankle rapidly got well, and in a month or two he was walking about as before. Two or three years after that, my opinion was sought about a well known literary man who had gout. On seeing him, the resemblance to the former case struck me forcibly, the parallel being very close, and the opinion given to his friend was this:—"Get his affairs put straight, get him out of the trouble he is in, and then he will begin to improve. The financial precedes the medicinal treatment of this case." The advice was taken, and not long after this I met the patient at dinner at his friend's, and he was well and hearty. The lesson contained in the above experience is at the service of any one who cares to take it.

Sydenham said :—"Moreover, the Tranquillity of Mind must be, by all Means, obtained; for all Perturbations, when they break the Bounds, mightily dissolve the Frame of the Spirits, that are the Instruments of Digestion; and so by Consequence much promote the Gout. The same Inconvenience follows too great an Application of the Mind to Study, and serious Things." It is very desirable, then, that after an attack of gout the patient be kept free from worry; and business men are very difficult to manage. If they go to business, it involves some worry; but, in other cases, to stay away causes more anxiety and worry, and so is worse. What to do, indeed, for the best is at times a very difficult matter. It is well to pursue a modified dietary, little flesh, and little alcohol. And yet,

at times, the patient makes no progress until tonics, and good food, and some generous wines are taken. In such cases the gout seems to have thoroughly cleared itself out of the system, leaving behind it the wonted condition of debility after illness; with delayed or deferred convalescence until the usual restorative measures are taken. A large number of keen observers have seen that unless a generous dietary be adopted the case is apt to linger on in much debility. Especially is this the case when the heart is feeble; and here the remarks of Stokes are worth quoting:—"It is necessary that wine or some other diffusible stimulant should be carefully administered, and the system supported by a proper aliment; for there is nothing more dangerous than by an interference with the usual habits of the patient to reduce the strength in these cases." Such a caution is required at the present day when the conviction is so strong about the evils of taking alcohol, that too severe a regimen is advised in some cases. Sydenham saw both sides of the question clearly—for he writes thus of the regimen of the gouty, especially as to liquors:—"It is moreover to be noted that those Men are most inclinable to this Disease, who, though their natural Concoction is lessened, are nourished more than enough, by Reason of a certain Luxury of the Blood; and they grow bulky, by Reason of some indigested Matter, instead of a good Substance and well compacted. And drinking of Wine does more increase this Luxury of the Blood; and moreover heaps up a new Stock of Matter, and actually occasions the Disease, by firing as it were, the *Fomes* of it, which has been laid up a long while.

Nor on the contrary, are too cooling Liquors to be used ; for these, by quite spoiling the Concoctions, and extinguishing the natural Heat, produce the greater Mischief ; not Pain, as Wine doth, but Death itself. As Experience teaches in those who freely indulge themselves in drinking Wine till they are old, and betaking themselves suddenly to drink small Liquors, have soon destroyed themselves."

The writer's own experience of a severe attack of gout in Vienna was as follows. While the gout was remaining, any fair meal with some wine would bring back the acute inflammation in two or three hours ; but when by a persistent severe regimen, the system was thoroughly cleared of gout, then some wine and a more liberal dietary were requisite to the treatment of the remaining debility. At first this more liberal regimen was eschewed, but soon it became clear that such was indispensable ; nor did a more liberal fare bring back the gout, as it restored the strength. The words of Garrod seemed appropriate to my own case :—"The disease being disposed of, the vigour and appetite of the patient returns, and this in proportion to the violence of the last fit." The difficulty is to be able to recognize the fact that the gout has not worked itself out ("Gout is the cure of gout") ; and when, there being still some gout remaining, the general condition must be carefully appraised, and the treatment be tentative in many cases.

There is a wide spread opinion that a fit of gout clears the system, like a thunderstorm clears the air. "Gout is the cure of gout" said Mead, and on that it was considered good to attempt to induce an attack of gout.

Garrod is directly opposed to any such scheme; but, I venture to differ from him, so far as my experience goes at present. I am inclined to think that many people abort attacks of gout by resort to colchicum, and so bottle up the gout in the system. At times an anti-lithic treatment seems to bring on an attack of acute gout, which leaves the patient in very much improved health, comparatively to the previous condition. A case in point suggests itself. A heavy, stout, muscular and corpulent man some years ago consulted me about himself. He had been a butcher by trade, but was unfitted for any exertion by gout in his feet and ankles. But the gout was not confined to those joints. Indeed he was saturated or sodden with gout; having had attack after attack, which he had aborted by free resort to colchicum, especially in the various gout pills freely advertised in the newspapers. He had a good family history, was only middle aged, and apparently could work for years longer if the gout would only permit of his getting about. I told him my opinion frankly; and encouraged him to endure the next attack of gout at all hazards, and take no colchicum. He was impressed, and determined to follow the advice. He was put upon potash and encouraged to be sweated. He did not lack courage, but it was sorely taxed; after a time it was evident that he was steadily improving. At last he came to thank me; he said he was "another man," and he certainly looked so. The pallor had gone; he wore once more the look of health; and he told me that he had started in business again and had stood one day in his shop for more than twelve hours

without any great discomfort. His own opinion was that the change of plan had reversed the aspect of his case; going on as he had been, he was steadily getting worse; under the new plan, he was once more a useful member of society, equal to working for his family. Such a case must be taken for what it is worth, and no more; but the result impressed me. I have tried to regain some trace of him, and find that he has been able to conduct his business without interruption since then; slight threatenings of gout showing themselves at intervals, chiefly after a very long day of work. He had given up all treatment for some time. Then came a time of depression due to business anxieties, and with this his old enemy. He was put upon some bitartrate of potash daily, and writes—"I have been real well in health lately. I do not eat much meat, and am a total abstainer." It was a long, and weary painful process, but he was rewarded at last.

In connection with this case, I should like to place before the reader a few words from Garrod about *Laville's tincture*, believed to be a potent preparation of colchicum. "It sometimes produces nausea, and often considerable purging, but at times neither one or other symptom is evidenced; but in almost every case, great and even sometimes magical relief is given to the sufferer, and if the tincture is taken when little more than a threatening of gout is present, the development of the attack is often prevented. So far all appears favourable; but through a long experience I have found that patients almost invariably give up its use after a few years, and some who

at first were most enthusiastic in its praise, have become the greatest advocates for its disuse, and have often abhorred its very name." So much for *Laville's tincture*, which certainly often does give relief in sub-acute articular gout when everything else seems powerless. But those who have recourse to it seem hoist with their own petard. Gairdner after describing the ordinary progress of chronic gout writes:—"The cases, on the contrary, in which the constitution struggles well with the disease, are very numerous, and these do not occur for the most part, in the strongest individuals. Very often they are found in persons of loose fibre, in whom the action of the heart was sound and unimpeded. Such persons generally have sharp and feverish attacks, attended with considerable temporary weakness. It is indeed not uncommon to see them pass through a long and self-indulgent life, with regular annual or bi-annual attacks of gout, which seem to have no other effect than that of restoring the individual to the enjoyment of better health; and even to observe the disease at the close of life, when all the vital and natural powers have felt the influence of time and progress of decay, also abate in virulence, and actually cease to trouble." He quotes a case where a gentleman lived to over a century, and who having had gout sixty years, was entirely free from it for ten years before his death, and walked firmly "as if he had never been afflicted with the disease." My patient just spoken of was of this habit of body, loose-fibred, but the heart was good.

Gout is held by many insurance companies to dete-

riorate the value of a life from their point of view, and some years are usually taken off a life, that is added to the premium, when the insurer has had an attack of gout. Normally a life is calculated to run seventy-five years. To add seven years in calculating the premium means, the office only credits the individual with sixty-eight years of potential life. But such a rule is at best but the office's calculation of probabilities. Nor do all offices make the same calculation. Garrod thinks that we do not yet possess a sufficient body of data to determine what is the effect of gout in shortening life. Certainly one attack of gout seems to leave behind it the liability to another; but while this may be made a safe general statement, each case must stand by its own features, not forgetting the family history. But just as one owner of a family estate may impoverish it by reckless expenditure, while the next holder clears it of incumbrances which the third man once more lays on it: so a grandfather may have gout; his son may be very abstemious and escape; while the grandson may again have gout from good living. The habits of the individual too will affect the prognosis very seriously.

In discussing the prognosis of gout, Garrod says:—"In concluding my remarks upon this subject I may state, that I consider even a single fit of gout, however slight, should be looked upon as an intimation that the patient cannot go on with impunity in his present habits of life; it is a warning either that he must change them or expect returns of the disease, which as time advances are certain to increase both in frequency and duration, and

are likely to embitter and shorten existence." And Garrod is an authority upon this subject, to whom all will listen with the most profound attention.

But as regards the prognosis of gout from an insurance point of view, something may be said on the other side. Gouty persons have to pay a high premium, if their lives are accepted at all, as a hard and fast rule. But Sir Charles Scudamore wisely draws a line betwixt cases where only one attack of gout has occurred, and those where the gout is recurrent. While admitting the fairness of the high premium in the latter cases, as to the first he thinks the increase of the premium "a fine beyond what is equitable." He also holds gouty people to have naturally good constitutions, and if they take timely care he concludes—"I should have more confidence in the integrity of their constitution to give the prospect of longevity, than in the constitution of other persons in general." He guards this by saying, "This observation I mean to apply to those who have not yet suffered much from the gout, and cannot fairly be extended to the unfortunate martyrs to the disease, whose health and constitution have been already broken down."

Verily and indeed Sir Charles had studied gout carefully, and knew it.

There are one or two words to be added here on more special points in gout before this chapter can be concluded. One is as to angina.

This is quite common—for angina—in comparatively young men whose fathers have died of angina. The son

is forty: the father died at sixty-five. So may the son at that age, when angina tests a heart no longer structurally sound. But at forty, with sound heart and arteries, the attacks of angina, however severe, carry with them little or no danger to life.

Then "bleeding at the nose" in persons with gout, or granular kidney, I have learned to dislike very much. Repeated bleedings at the nose in robust persons over middle age are very ominous in my experience. Gairdner says, "I have never seen blood poured in copious streams from the nose—and the symptom is by no means rare—without having good reason, sooner or later, to trace it to mischief about the heart. But it is itself a formidable occurrence, often with difficulty restrained, and nearly always leading to the metastatic and atonic forms of the disease." Hæmaturia he holds to be rare; while, as all know, hæmorrhoids are common with the gouty. So is menorrhagia. Melæna is not uncommon. Fulness, or as Sydenham called it, "luxury" of blood, is connected with all these recurrent hæmorrhages.

Then a few words as to the internal complications of gout. Budd writes: "It has been already stated that in chronic gout a painful affection of the stomach sometimes alternates with that of the extremities. This affection is not inflammatory in character, nor generally dangerous to life; the pain attending it is like cramp or gastrodynia, and is usually relieved by pressure; the heat of the surface is rather below than above the natural standard, and there is seldom vomiting. But when affections of the stomach succeed to well-marked acute gout of the

extremities, in the height of a febrile paroxysm, the symptoms are much more alarming, and often tend rapidly to a fatal issue. In such cases the pain is very severe, is usually attended with incessant vomiting or hiccough; and when the bowels are affected, with profuse diarrhoea also. At first there is considerable fever, but if the symptoms are not relieved collapse ensues early, and soon terminates in death. The early symptoms, therefore, are of an inflammatory kind, like those of the affections of which they have taken the place. It is of the highest importance to discriminate well between these two forms of gout at the stomach, because they require opposite plans of treatment. There can be no doubt that these internal affections are as specific in nature as the gout of external parts. We consider the following facts to be sufficient proofs of the truth of this proposition. The affections in question do not run the course of common inflammation, or of any other simple form of disease; they alternate in a complete and remarkably sudden manner with gout of the extremities, and if we can succeed in fixing the latter, the internal affection is at once and permanently relieved." Gouty cramp of the bowels, and gouty muco-enteritis are then two essentially different maladies, carrying with them each its own prognosis.

Then as to abscesses connected with gouty deposits. Garrod says:—"I have seen many abscesses formed around gouty nodules, which have given exit to a large amount of pus, as well as urate of soda, on being punctured; this has especially occurred in patients in a weak

state of health. It not uncommonly happens, that when patients are suffering from these abscesses which are keeping up a constant discharge of matter, they enjoy a comparative immunity from active gout; and I have known several instances in which the healing of these abscesses was followed by a sharp attack of gout in some other part of the body, showing that the ulcers had acted as a kind of safety valve." It is somewhat odd that Dr. Garrod, who has been at such infinite pains to determine the actual presence of uric acid in most cases, has not done so as regards the discharge of these ulcers; at least he says nothing about this. It would seem probable that such might be the case. There is no uric acid in sweat; and yet my distinct impression is that gouty patients who perspire freely get on better than do those whose skins are dry. Further, warm clothes which keep the skin active, are good for gouty persons, as all know. But if the perspiration does not contain uric acid, a moist skin, natural or attained artificially, is good; so the discharge of the ulcers may not contain uric acid, yet the ulcers may keep off a gouty condition, and their healing-up be followed by gouty joint manifestations. Dr. Budd says above, that a gouty malady is not like any "simple form of disease" in its course; nor is gout a "simple" disease under any circumstances. Its diagnosis might be made a comparatively simple matter if applying a blister, and finding evidences of uric acid in the serum, could be accepted as the test of gout. Even granting that such a plan has very much in its favour in any doubtful case; this would leave us as far as ever

from any simplicity in ascertaining the prognosis. This involves a good grasp of the natural history of gout, first; and after that an intimate acquaintance with the individual in whom the gout is present, from his family history to the narrative of his own personality. After such collection of data, there comes the weighing thereof in the mental balance; and what is "the personal equation" of each man who has the task of weighing, is unknown to the writer; and therefore he cannot make any attempt to estimate it. Some might found their prognosis on the contents of a test-tube and their reactions; another on the microscopic appearance of sediments passed in the urine,—watching the fitful turns of the disease by such means; but this mode of examination (which is, after all, but the scientific aspect of the old "water-doctor" of whom Shakespeare wrote, and who still lived even up to recently in Yorkshire,) is insufficient to give much real information; and may mislead, as the following instance will show. In my early days of practice in Westmoreland, I was called to an old body with complete suppression of urine. Copland's Dictionary was carefully consulted, and the section on "*Ischuria Renalis*," eagerly devoured. Cupping over the loins and purging with a gentle diuretic, and, after awhile, some urine made its appearance. This was tested in all ways, and a careful microscopic examination made of it. Some fine tube-casts were found; and being duly impressed with what Sir Thomas Watson said about the significance of tube casts as indicating an incurable condition of the kidneys, I jumped to the conclusion that the old woman (about

sixty), would die ere long. This opinion was very distasteful to her, and she soon took the opportunity of consulting an unqualified practitioner living a few miles away; who was said to have held out great hopes to her. This was very galling to my enthusiasm. I had taken a great deal of pains over the case without any expectation of any pecuniary reward; the neighbours of the old beldam were in ill-humour because my efforts had saved her from dying, the termination they all were hoping for; she was sulky about being alarmed unnecessarily as to dying; everybody was dissatisfied: including myself, at having put my foot in it so egregiously, after all the pains I had taken. Sometime afterwards meeting the irregular practitioner, I asked him how he could form the opinion he did, explaining that "I had examined the urine under the microscope and found tube-casts." His rejoinder was not exactly grammatical: "I know nothing about na (any) microscopes; I never saw one; but I know the old woman only wants something to eat and drink, and she will do well enough!" This was a dreadful blow to me, having just passed through the mint of the Edinburgh University, when Professor John Hughes Bennett was in the zenith of his power. The confidence with which the old quack disdained the microscope, was more trying than his evident belief in his own opinion. Time wore on, the old dame made steady progress, and scowled fiendishly at me whenever I rode past her cottage. I began to see that the old scoffer at the microscope had calculated some matters omitted in my equation, viz. the family history, the physique of the woman

herself, and her obvious freedom from serious disease. And he was right too : for the old woman still lives after sixteen years, and my prognosis remains unverified yet. It was a bitter lesson at the time, but it has stood me in good stead on many an occasion since then in not building my prognosis too conclusively upon the urine and its revelations.

As to albumen, its relation to gout is but incidental, except when the heart is failing, with or without valvular lesion ; and then the presence of albumen taken with the fall in the bulk of urine, tells of full veins and slack arteries, because the blood-pump is losing its vigour.

It is the *tout ensemble* which must be the guide, special indications being taken into the calculation. Some reader might wish for a well-observed case, bristling with detail. Certainly, there would be no difficulty in giving several such cases if any good end would be served by doing so. The ordinary reader would either not read the case at all ; or would read it only by the light of some case in which he was immediately interested, with which it could scarcely be expected to tally in all respects ; and then the points of difference would be a source of disturbance. The man who would read and weigh every detail is much more fit to write a book himself than to read one for its mere information. Broad general instructions are more largely useful in my opinion, and the utility of a book to the reader is or ought to be, after all, the great end of book-writing.

CHAPTER VII.

THE CAUSES OF GOUT.

THE careful perusal of the foregoing chapters will render the subject of gout so familiar to the reader, that it will not be necessary here to go at any length into details in connection with the causes of gout. They are (1) predisposing, and (2) exciting.

(1.) Of predisposing causes there is none so potent as heredity. "Breed is stronger than pasture." At the same time that we admit that good living in the past causes gout in the present; so we are compelled to admit that good living in the present will give rise, in all probability to gout in the future. The well-born gentleman, who can trace a long descent, often inherits gout. The successful business-man who has risen by his own exertions, often cultivates gout for himself; but more frequently sows the seeds for his offspring. On pointing to a typically gouty man (an old brewery servant) once when talking with an American doctor, she remarked, "We have no gout in my country." A Scotch doctor, not entirely unacquainted with gout himself, standing by remarked, "Nor in mine, either;" adding, "we have not been rich long enough in either country to have gout." A remark which profoundly impressed me. The possession of superfluous wealth is, then, unquestionably a

factor in the production of gout, in so far as it confers the capacity to procure liberal quantities of food and drink. How this has been brought about through the liver has been spoken of before (p. 8). An insufficient liver forms uric acid in excess, instead of the normal urea of mammals.

(2.) *Exciting.* These are, broadly speaking, excess of animal food, leading to much nitrogenized waste; imperfect oxygenation, leading to the formation of uric acid, instead of urea; mental causes affecting the liver; and lead-poisoning: all of which act upon the system. Then there are local causes, as strain or injury, either acute or persisting.

The effect of good living upon the production of gout has been an observation made ever since the subject was first studied. All authorities agree that good food—that is albuminoid food—in excess of the wants of the organism, is the main cause of gout. Scudamore thought coachmen, butlers, hall porters, who eat grossly and drink much malt liquor, are specially liable to gout. That innkeepers are subject to gout, beyond those of other occupations is notorious; they usually live freely. Butchers too, he holds, are often attacked with gout; an observation falling within the experience of most of us. Budd held that the men who raise ballast from the bottom of the river are specially liable to gout; rather from the amount of porter they drink during the hours of work when their labour is very severe, than from any excess of food. The malt liquor is the main factor, he holds, but “the exposure of ballasters to wet and changes of temperature probably

favours its operation. These men are almost all derived from the peasantry of Ireland ; they can rarely, therefore, inherit a disposition to gout." They do, however, eat heartily in order to perform their work. He states that an old country practitioner told him that gout, in his opinion, was less frequent now than in days past amidst farmers and tradesmen. Budd's comment is, "Allowing that free drinking was more common in those times, we must also remark the important fact that vegetables were scarce and dear, and that meat formed a much larger proportion of food than at present."

Malt liquors, when taken with excessive quantities of food, especially animal, unquestionably tend to induce gout. In the broad square subjects of gout malt liquors may be taken in moderate quantities without much injury ; provided that at the same time the amount of nitrogenous food taken be small : but both may not be taken together in liberal quantities. While in those of thin flank, especially if there be also a tendency to dyspepsia, malt liquors are ever injurious. Such persons soon have to forego malt liquors, if ever they could drink them. When they begin to suffer from hepatic disturbances, no matter whether biliousness or lithiasis, malt liquors in all forms must be abandoned.

Indolence, whether voluntary or enforced, has often much to do with the development of gout. Thus hall porters, for instance, who live well and take little exercise, commonly become the subjects of gout. Voluntary indolence is a well-recognized factor of gout. But enforced indolence is less generally familiar. Yet, when

a person with a tendency to gout is incapacitated from taking his wonted exercise, he rapidly becomes the subject of gout, unless and provided he alters his dietary accordingly. Thus gout in the lower limbs carries with it a worse outlook than gout in the hands, because it cripples the individual as regards the taking of exercise. Coachmen, who are liable to gout in their hands, commonly remain hale as regards their general health; while butlers, who usually have gout in their feet, have a decided tendency to go on from bad to worse. The country squire, who has been equal to severe exercise—shooting or hunting—has an attack of gout in his lower extremities, which makes such pursuits no longer possible; he has to be satisfied with a walk, crawling along with a stick. If he do not reduce his dietary accordingly, chronic gout will be his assiduous attendant. Not rarely one meets an old friend, not seen for some time, with unmistakable symptoms of gout. On inquiry, he tells one something of this kind: "I had an accident, and have had to give up riding and take to driving. Very soon the gout put in an appearance." Or a man passes rapidly from an active life in the country to a comparatively sedentary life in a town, and then he first suffers from gout. When the contrary happens gout may take its leave, as in the case related by Van Swieten. A rich gouty old priest was taken captive by the pirates of Barbary, who kept him hard at work as a galley slave with little to eat. He soon lost his gout.

Then there are cases where some particular beverage alone excites gout when taken even in very small quan-

tities. With one man a single glass of port wine will elicit symptoms of gout, though he can take other wines and spirits with comparative impunity. With others it is champagne which disagrees. A glass or two, especially if of doubtful quality, will bring out gout in a few hours. A rich wine like Marcobrunner is apt to do the same thing. Often all generous wines have to be given up, and the gouty individual may still keep a good cellar; but it is for his friends, he himself being confined to wines he would never dream of setting before his guests.

Then age has much to do with the development of gout. The broad rule is, that as age advances the tendency to gout grows stronger. Especially is this true of self-acquired gout, induced by the habits of the individual. In strictly inherited gout a severe attack may be experienced in early life, and after that the individual enjoy comparative immunity. Or in some instances a gouty person ceases to be gouty; but in such cases, if carefully examined, some cause sufficiently explanatory will usually be found. Speaking generally, it is safe to say that when the liver has once acquired the habit of forming urates in excess, these mal-products of the liver-digestion tease and irritate the kidneys into disease; which stealthily progresses as years go on, while the power of the kidney to cast out uric acid decreases steadily. It is an illustration of the old saw, "The further in the deeper." Then as the system becomes saturated with gout-poison, as it does in some cases, the victim of gout grows steadily worse as regards the clinical phenomena

exhibited. Sex also is not without its influence. Men are more liable to gout than women; nor is it difficult to understand why this should be, when we reflect on the dietary and regimen of men and women. Mason Good says:—"Women are not very liable to gout, probably from their more regular and abstemious mode of living; but those females whom it attacks are generally of robust and full habit." And certainly many ladies have indulged in the pleasures of the table beyond the custom of their sex. Women are more liable to gout after the disappearance of the menses. About that there is a general consensus of opinion, from Hippocrates downwards. The old Greek physician held that women suffered little from gout until their menses ceased; and Scudamore and others hold with him. Scudamore says:—"The actions of the uterus are not without effect in counteracting a general redundancy of blood. A gout of imperfect development, or of a chronic form, is more common in women than men." Menorrhagia, often accompanied by much suffering, is not uncommon in females who, later on in life, suffer from unmistakable gout.

Exposure to weather is unquestionably one cause of outbreaks of gout. Garrod thinks the urinary concretions of the eastern counties of Great Britain are linked with the cold north-eastern blasts which blow there. When the action of the skin is suppressed, this influences the formation of uric acid (not its elimination, as uric acid is not a normal constituent of the perspiration in his opinion). He says—"Suppressed perspira-

tion is immediately followed by an increase of urinary acidity, and the precipitation of the uric acid either in the form of urate of soda or in a free and crystalline state." Free exposure to the weather produces certain forms of gout, especially those that lie on the borderland of gout and rheumatism—what may fairly be termed "the rheumatic forms of gout;" as sciatica, arthritis of the hip, and "rheumatic joints," in the knee, shoulder, and elbow, the affections of the large joints, indeed; and muscular and ligamentous pains with stiffness.

Then, again, temperature has an influence. Some gouty persons suffer most when the weather is cold, apparently from the suppression of the perspiration; others when it is warm, apparently from defective oxidation.* Few are comfortable in an east wind. As a rule, those whose skins act freely get on better on the whole, than those gouty individuals who have habitually dry imperspirable skins. Articular gout is, in my opinion, less affected by seasons, than other manifestations of gout, and, notably, bronchitis.

The mental relations of gout are well known. All writers are agreed as to the effect of worry, anxiety, and fatigue, or depression of spirits, as excitant causes of gout. Not only so, but in two well marked instances (given before) there was no rally of the system to throw off the gout, until the mental condition was relieved; after which an improvement soon set in. That mental

* This was well seen in an aged couple, both gouty. In cold weather the lady was in excellent health, while the gentleman knew no comfort; in hot weather the position was reversed.

excitement or agitation will bring on an attack of gout is recognized in the adage—"Bacchus pater, Venus mater, et Ira obstetrix arthritidis." This does not refer to the effect of mental disturbance in upsetting the action of the liver, and so leading to the formation of uric acid in excess; but to the lighting up of an acute condition in joints the subject of chronic gout. Indeed, gout is affected by mental causes as well as by physical agencies, beyond all doubt. When an attack of dyspepsia is induced by mental causes it is very apt to set up acute gout in persons of the gouty cachexia; just as indigestion, from injudicious eating, and food unsuitable in character or amount may excite such disturbances in the liver as may lead to excessive formation of urates. But when mental disturbance is the cause of the acute indigestion, the effect upon the liver is rendered more certain than in those cases of indigestion due to the nature of the food, or the amount of the meal. Gouty persons who also are dyspeptic, should be very careful to avoid indigestion; especially that which is set up by, and due to, emotion.

Then lead is linked with gout, as has been shewn before (chap. V., p. 131). Persons who are the subjects of chronic lead impregnation, have much uric acid in their blood and urine; and an attack of gout is readily produced in them from slight exciting causes. Just as, conversely, gouty persons are unusually susceptible to lead.

Then there are also local exciting causes of gout. Study of the causation of gout tells unmistakably that the locality of gouty manifestations is commonly determined by the occupation of the individual leading to

strain, or excessive use of certain organs causing the development of gout therein. The great toe is liable to strain with most persons, therefore it is the favourite seat of gout. In heavy men the tendo Achillis is often affected. In coachmen the hands suffer, as is well seen in the numerous cases of gouty hands in the drivers of the London General Omnibus Company, otherwise very healthy men. In a case which was long under my care at the West London Hospital, the man suffered in his right hand solely. He was a signal man on the Great Western railway, confined to his box all day. He was distinctly of the gouty diathesis; but his trouble lay solely in his right hand, with which he pulled the handles of his signals (which at the same time locked the points), an act involving a very considerable effort.

It is not rare to find an injury to a part leading to an outburst of gout therein. For instance an old man had his toe injured by a heavy stone falling on it; gout, hitherto unknown to him, settled in the spot immediately, and remained there for some weeks, despite treatment directed to lithiasis. Or a gouty man has a finger end crushed by machinery, and a severe attack of gout in the whole hand is the result.

An injury to a part will not only set up gout therein; but in after years gout may take up its abode at that point. Rheumatic pains, of gouty association, are often complained of at the seat of old injuries, years after the injury had been experienced; and when it had almost been forgotten, till the pain felt therein recalled it to the sufferer's memory.

This brief *résumé* of the exciting causes of gout, will not only serve to keep the reader's eye on the relation of local agencies to the development of gout in certain localities; but will also suggest to him the desirability of advising the patient to avoid anything which might act as such local excitant of gout in the case of individuals who manifest gouty tendencies; and by so doing avert the suffering which would otherwise be induced, if the local cause continued in operation.

CHAPTER VIII.

ACUTE GOUT.

THE diagnosis of acute gout does not depend more on the symptoms presented by the patient, than on the medical man's capacity to read them aright. Few that have made careful study of gout in its varied forms will experience any hesitation about the truth of this statement. In a preceding chapter the subject of the diagnosis of gout has been dealt with. Here the associations and phenomena of an acute paroxysm will be given in a condensed form, and contrasted with each other.

When the great toe is suddenly affected, probably a tyro would be on his guard against the error of mistaking gouty for ordinary inflammation. But if the acute articular attack be elsewhere, then the ready diagnosis dwindles away into uncertainty; perhaps into disbelief. If the paroxysm be not articular, then in all probability its association with gout is scarcely suspected; except by the man who "has got his eye in for it," to use a craft phrase which tells that familiarity with a thing may be essential to its ready recognition. To the man who has studied gout, the phenomena may be soluble into their right constituents. Like the handwriting on the wall of Belshazzar's banqueting-hall, which no Chaldean sage could interpret, but which Daniel read with ease; so the phenomena of non-articular gout forms a riddle not to be

solved by the inexperienced ; though often presenting no great difficulty to those who know them, and can read the signification thereof. At other times the acutest observer familiar with the Protean aspects of gout, may honestly hesitate and decline to express a positive opinion.

There is, however, a congeries of associations which points to the gouty origin of the ailment. Thus Garrod says, "Prior to a first attack of gout, there is generally an absence of any prominent premonitory symptoms, although disturbance of the function of some organs would, probably, be observed, if the patient were narrowly watched for a few days preceding the fit ; but afterwards there are usually uncomfortable sensations experienced for days or weeks before a fit, which are generally referable to the digestive organs ; such as heartburn, acidity, flatulence, drowsiness after food, hiccough, confined bowels, loss of appetite, lowness of spirits, and a feeling of lassitude." This grouping of the phenomena is most happy. Beyond this group of symptoms, there are special phenomena according to the nature of the individual case. There may be "palpitation of the heart, or intermission of the pulse ;" or "hæmorrhoids, or irritability of the bladder ;" may be "excessive cramps or irritability of the bowels ;" or there are "psychical phenomena ;" "the temper is often much ruffled, and the patient becomes peevish and irritable." When "subject to bronchitis or other chronic affections of the chest, an increase of cough and dyspnœa may precede a fit, and be greatly relieved on the occurrence of the gouty paroxysm."

It is, indeed, about the first acute manifestation of gout that the great difficulty is usually experienced. After one experience the patient can commonly help the medical man very much to a correct diagnosis. But as to the first attack, it is very frequently not suspected that the malady is gouty in its nature, until some subsequent event, as desquamation of the skin, if an articular attack; if non-articular, the occurrence of subsequent inflammation in the ball of the great toe, or a gouty skin-affection of unmistakable character, first lights up suspicion that gout underlies the affection in question. For instance, a man of magnificent physique recently presented himself from the West of England, with an irregular pulse and a weak, dilated heart, complaining of difficulty of breathing and a tightness round the throat. He had a dilated right heart, which might account for the symptoms; but still the impression was created by the symptoms that there was something more, and beyond this. In a week or two this "something" resolved itself into gout most unmistakably. The history of the case suggested such an association as a possible hypothesis; but the suspicion of aneurysm could not be lost sight of. The case has since gone on as one of irregular gout, in which the articulations became involved some weeks only after the first symptoms developed themselves. A depressed action of the heart coming on suddenly without loss of digestive capacity in a stalwart person, carries with it an inherent likelihood of gout.

Leaving the articular implications aside for the present, it may be well to review some of the manifestations

exhibited when a paroxysm of gout is about to occur. Scudamore classifies them at length (p. 132). There may be disturbance of the alimentary canal, exhibited by an altered state of the tongue, accompanied by some taste in the mouth; the fur of the tongue being white, yellow, or brown as the case may be. In other cases the tongue is bare of epithelium, with prominent papillæ. There are more or less, "Heartburn, eructations which are sour, attended by a sense of heat, and often conveying the odour of yesterday's meal; a craving appetite, which does not become comfortably satisfied; oppression after a meal, with a painful sense of distension, and soreness of the whole epigastric region." Flatulence after food is common, or the symptoms may be those known as "bilious," with disorder of the secretions of the bowels, altering the character of the fæcal evacuations: or, as Abernethy writes—in that famous treatise which had so much to do with "the blue pill and black draught" treatment which, wisely used by him, led to much abuse in the hands of the incapable copiers of a skilful pioneer—"the secretions of the liver are either suspended, diminished, or vitiated; the bowels are either purged or costive, and the fæces foetid." Or the colour of the fæces may be altered: when the urine is laden with white lithates the fæces are pale usually; when the urine is high-coloured and smelling strongly the fæces are usually dark and very offensive; or they may be clay-coloured or green.

There is often much sense of distension, even before food is taken, with or without marked flatulence, often

unrelieved by the passage of flatus. Often, too, there is distinct acidity, with sour eructations or pyrosis. Hiccough is common, with some dyspnoea at times. The patient is nervous about himself, and becomes alarmed at the symptoms. Cullen observed this, and says that atonic gout is "often attended with all the symptoms of hypochondriasis: as dejection of mind, a constant and anxious attention to the slightest feelings; an imaginary aggravation of these, and an apprehension of danger from them."

The liver may be so disturbed as to cause the patient to lie on the right side only; there may be pain in the shoulder-tip, or behind at the inner angle of the scapulæ, experienced for some time before the more pronounced symptoms show themselves.

Then the patient may have piles. Bleeding from these often gives great relief to the symptoms produced by the viscera in connection with the portal circulation being congested. Sometimes, instead of loss of appetite, bulimia is present, as a result of an altered state of the mucous lining of the alimentary canal.

The mucous membranes are liable to be affected, and a dry cough often precedes an outbreak of gout. Actual pleurisy, or even pneumonia, may be the first phenomenon of a gouty paroxysm, according to Scudamore; and be relieved on the supervention of gout elsewhere.

Irritation of the bladder and urethra, with a secretion of mucus inducing the patient to believe that he has got gonorrhoea (particularly if he has recently run the risk of such infection) is experienced at other times. If a

stricture exist, it may take on active subjective symptoms previous to the oncome of acute gout.

Then there are disturbances of the nervous system. The sensorium is affected in some cases, and the patients complain of pain in the head, with or without sense of fulness; or of giddiness, often with much loss of self-control; or there may be a sense of formication, or itching in the skin; or cramps are complained of: less commonly there are chills or flushings.

Irregular, or depressed action of the heart, alone or combined, may be the chief phenomenon, causing great alarm to the patient and his friends. At times any attempt to leave the recumbent posture is accompanied by a sense of fainting; or there may be pulsation of the aorta distinctly felt at the epigastrium.

Such are the chief manifestations of gout before the joints are affected; sometimes with the great toe being implicated. When the latter occurs the interpretation of the preceding phenomena is rendered easy. When no such corroborative testimony is furnished, the diagnosis remains shrouded in doubt. Much of the difficulty lies in the practitioner devoting his attention too exclusively to the local phenomena, and not enough to those general disturbances just enumerated; which will often help materially in solving the difficulty of diagnosis.

Now as to the phenomena of a fit of regular articular gout in the ball of the great toe. Sydenham's description is familiar to all who are interested in gout. The following description is drawn from Scudamore. A person, who may have premonitory disturbance of the system, or

have felt quite well, is awakened in the early morning with pain in the ball of one foot; soon there follow sensations of heat, weight, and stiffness, passing on to burning and throbbing. This goes on for some time, after which some relief is experienced; the patient at times even passing into sleep with some perspiration. Next morning the skin is red, shining, and tense with the swelling beneath, while the veins are full. In mild cases the pain is easier in the day, but returns again in the night. The integuments pit on pressure; but the pain so produced is intense. In bad cases the surface becomes scarlet red. The suffering is great; there is heat, weight, and throbbing pain; while the weight of the bedclothes makes them unbearable. When there is little systemic disturbance the patient may think he has sprained his foot; at other times the general disturbance is great. In the latter case the suspicion of gout is more readily aroused. The inflammation usually progresses for a few days, and then declines. At other times the defervescence in one toe is synchronous with inflammation showing itself in the other toe; or may be elsewhere, as in the hand. Then the nature of the case is clear enough. When the inflammation has subsided, the cuticle is left wrinkled, indicating the shrinking of the tissues beneath; and not rarely it is shed in flakes. Much itching may be experienced during the shrinking and shedding of the cuticle. Such is the natural history of an ordinary attack of regular articular gout in the ball of the great toe.

At other times the articulations of the instep, or even

of the heel are the most painful parts. Any tenderness of the tendo Achillis before or at the time of the articular attack is most suggestive.

Such regular articular attack may, or may not, be preceded by some other manifestations of gouty-character. Where such has been the case the development of gouty mischief in the ball of the great toe, will often give great relief to the previous trouble, be it what it may. Women commonly suffer more from irregular manifestations of gout previous to the toe being affected than men do.

The return of such attacks depends so much upon the inherited predisposition and the habits of the individual, that no prophecy can be safely indulged in as to future attacks. When the system becomes saturated with gout-poison, usually the acute attacks are not confined to the great toe, but are experienced elsewhere.

The pain of an attack of acute gout is very severe. Sir Thomas Watson told of the Frenchman who described gout and rheumatism in this contrast: "Place your joint in a vice, and screw the vice up till you can endure it no longer, that may represent rheumatism; then give the instrument another twist, and you will obtain a notion of gout." The smarter the inflammation the greater the pain as a rule; but to this there are exceptions—fortunately for the patient. Scudamore thinks the sense of weight and powerlessness greatest when the anterior surface of the foot is the locality of the mischief; while the throbbing is greatest in the ball of the toe; and the sense of tightness worst when the elbow and tendons at the wrist

are implicated. When "the affected parts are tendinous in structure, the difficulty of motion is increased, and the most careful attempts are followed by agonizing pain, and sudden excruciating cramp," and this may occur when the attack seems slight, or when the defervescence is established. Sometimes one nerve-branch seems to be specially affected, possibly by gouty inflammation of its sheath. He says:—"It sometimes happens that a branch of a nerve in the extremities is distinctly affected." There may be no external evidence of trouble in the nerve, though the pain may become excruciating.

Sydenham knew the general restlessness in gout; and Scudamore says:—"Some patients inform me, that in their most painful fits, they suffer still more distress from nervousness and general irritation, and extreme restlessness, than from the pain itself. In persons of irritable constitution, the extreme pain which is sometimes produced by gout, has the effect of disturbing the brain and nerves so violently, as to occasion high delirium."

Cramp is a great source of agony often. It may show itself in the muscles of the leg, or thigh; in the interossei, or the intercostal muscles; or even in the diaphragm. The pain is intense, and when the cramp seizes the calf, the muscles may be seen to quiver after the attack is over. Lesser muscular contractions, as jerking, may also occur. When the stomach is the seat of cramp, there is danger to life.

There is nothing peculiar about the systemic fever of acute gout, or the high temperature of the affected joint; at least so far as seems known at present. Rigors are

felt in some cases. Some, however, seem to suffer more from nervous irritability than the fever set up by the attack. Nor is there anything singular about the pulse, which is increased in frequency as usual in pyrexia.

Garrod thinks that cedema is a marked feature of gouty inflammation, though the tension in the early stage masks it; but as soon as the inflammation begins to subside, then the pitting on pressure is readily observable. Desquamation of the cuticle follows; and even the nails have been shed, he says. Certain it is the nails will often tell of attacks of gout, even when they may have been slight; though this is confined to certain individuals. He also thinks that gouty inflammation differs from ordinary inflammation in the rarity of subsequent suppuration. In one case known to me, ulceration followed a first attack of gout (in the ankle). Sometimes cases of acute gout are mistaken for acute rheumatism. In a case well-known to myself the hands and feet were attacked, the mischief abating in one extremity synchronously with its appearance in another; very much like acute rheumatism.

Sometimes the foot remains free from another attack for years; in other cases the acute gout soon returns; while in others permanent injury is done, the foot growing worse and worse, with acute attacks at intervals. Or the gout may attach itself to the skin, abandoning the joints. Or it may cling to the viscera, as especially the aortic valves. When the local disease threatens to persist as a chronic condition, then the patient must look ahead, and take active measures to prevent being crippled.

CHAPTER IX.

THE TREATMENT OF CHRONIC GOUT.

"GOUT is the disease of those who will have it!" Such was the dogma of a writer now unknown. His harsh but shrewd statement survives as a quotation. That there is much truth in the brief summary is certain; even if it be an unacceptable doctrine to the gouty. Budd sums up in the same strain. "We have seen that the chief causes of gout, setting aside hereditary disposition, are free living and sedentary habits, it follows, therefore, that the surest means of prevention are temperance and active exercise. When hereditary tendency is present, temperance especially should be strictly observed, and a preponderance of vegetables in the habitual food is also advisable. In short, those threatened with gout should imitate, as far as practicable and consistent with comfort, the habits of agricultural labourers." This too is harsh. As regards the regimen the patient must steadily retrace the steps of his forefathers, and return to the workman's estate; go back to "the grand old gardener," from whom he derives his ultimate descent. In such return to primitive times will be found, as a rule, his only safeguard against his foe.

"When Adam delved and Eve span
Who was then the gentleman?"

sang John Ball. The "gentleman" has to take all the

consequences, pleasant and unpleasant, of such outcome of social evolution. To get rid of the unpleasant, he must sacrifice the pleasant belongings of the gentlemanly caste. This is a price most men are not prepared to pay. Still an approach thereto is essential. The best efforts of the patient must second the well matured plans of the medical adviser, for satisfactory results. Todd's remarks given on the back of the title-page, may be well-weighed both by patient and physician: for their co-operation is distinctly called for.

In the commencing chapter of this work it is pointed out that uric acid is a product of secondary digestion in the liver. This viscus, from various causes, fails to convert the surplusage of our albuminoid food, and the debris of our tissues into urea; and forms an excessive quantity of the less oxidised uric acid. In other words it is degraded into forming the uric acid of animals with a solid urine, instead of the urea of the mammalia with a fluid urine.

The lines on which the excess of uric acid is to be attacked, are two.

1. The prevention of the formation of uric acid.
2. The resort to solvents of uric acid.

On these two great lines our treatment must be conducted. But certain palliative measures are often indicated, so we may add a third—as the relief of pain.

3. Palliative measures, as analgesics.

The two first measures will mainly occupy our attention; the third involves the well-known rules as to the resort to narcotics and analgesics, with some modifica-

tions to meet the peculiarities of gouty individuals. For instance, the subjects of the gouty kidney are often very intolerant of opium and mercury.

1. The prevention of the formation of uric acid. The great advantage of a knowledge of the exact character of gout-poison lies in it enabling us to see clearly what our predecessors only could "see through a glass darkly." They knew from an experience stretching from Hippocrates downwards, that too much animal food was bad for gout. We now know how and why this is. To put it briefly, gout is due to a dietary containing albuminoid matters in excess of our tissue-needs. Our measures then must commence with a proper estimation of this cardinal fact.

Prout says about the formation of uric acid, "The error of *quantity* in diet is of infinitely more importance than the error of quality. Any stomach may digest a *little* of anything; but no stomach can digest a *great deal* of anything!" This statement would seem at first sight opposed to what I have just said. He takes care to point out that this maxim does not mean "a little of whatever comes in their way;" and states what foods are chiefly objectionable. The point I desire to impress upon the reader is this, that a small quantity can often be digested properly; where if a greater amount be taken, some will certainly be left imperfectly assimilated. This bears upon the subject of the formation of uric acid. In Part I. the matter is discussed of how far certain imperfect products of gastro-intestinal or primary digestion find their way into the portal circulation, and thence to

the liver; which are unfit for further elaboration by the hepatic, or secondary digestion, and therefore are not passed on to the albumen of the liquor sanguinis; but are at once sent on a downward, or retrograde metamorphosis towards a bile acid or a urine solid (Part I., p 278). It is in these imperfectly assimilated products that we find, in all probability, the commencement of the vicious habit of the formation of uric acid. An habitual excess of these products imperfectly digested in the gastro-intestinal canal, leads to deterioration of function in the liver; and such impaired functional capacity of the liver may be handed down as an inheritance. "An insufficient liver and an ungrateful stomach" was the description of a patient's malady sent me recently by Fordyce Barker. And the linked product of such an association is certainly uric acid in excess. This matter will be reverted to again when the matter of dyspepsia in the gouty is being considered (p. 190).

To reduce the albuminoid constituents of the food to the requirements of the tissue-needs is clearly the first step in the treatment of gout; the initial act of the prevention of the formation of gout-poison. This is not always easy. The patient likes the sensations of a brain well-flooded with such nutritive blood; and is unwilling to forego such sensations, until the depression produced by the action of the imperfectly digested matters counterbalances these sensations of well-being. Further, these albuminoid matters may be the food most acceptable to the stomach; which resents any accumulation of starch in it, or is offended by fat floating about in it during the

digestive act. Symptoms of acute primary indigestion are set up by any deviation from a strict dietary; and, therefore, the patient is very unwilling to start any alteration.

In such cases the resources of the medical man, both as to his knowledge of digestive processes, and his acquaintance with human nature, are severely taxed. In other cases, the indulgence in albuminoids is nothing more than a matter of the palate, which craves something toothsome, or "savoury meat." Here the treatment of the case is comparatively simple; provided the patient loyally obeys his instructions. The flesh of animals is especially to be foregone. Beef, veal, pork, and mutton, are to be avoided, or taken sparingly. Of course other meats, as the flesh of smaller animals and of birds, fall into the same category of food to be shunned. There is, however, a consensus of opinion that "white meat" is less objectionable than "brown meat." Pork and veal are "white meats" in a cook's eyes perhaps; but certainly not in a scheme dietetical. Consequently the meat of the chicken is to be preferred to that of the duck, goose, and turkey. That of the rabbit to the hare. Venison and game are, of course, in the class of prohibited meats; but practically they can only be indulged in by the most affluent, their price limits their consumption with most persons.

Fish should be largely the food of the gouty. The constituents of the fibre of fish are chemically those of the flesh of animals; but, as St. Paul points out, there is a difference: and the difference lies in the amount of water

in fish-fibre. Then white fish are better than those of darker fibre, especially where any indigestion exists. The whiting, the haddock, the cod, the flat-fishes—turbot, brill, halibut, and sole, are to be preferred to the rich salmon, the tunny fish, the mackerel, the grey mullet, the herring and pilchard. The trout and the red mullet are the game of the stream and ocean. Shell-fish, as the oyster, mussel, shrimp, lobster, cray-fish and crab, are not to be forbidden, except when any particular article specially disagrees with a patient.

Eggs of course, whether those of the hen, the plover, the sturgeon, or the cod, are all highly albuminous.

Then there are other albuminoids, especially caseine. There is vegetable caseine chiefly found in the legumes; and the animal caseine of milk, which Morgagni, like Celsus and Pliny, found good for gout.

Some remarks may be offered here as to the choice of albuminoid food for the gouty. Why should white meat be preferable to brown meat? The following observations must be taken for what they are worth, neither more nor less. There would appear from the lessons of practical medicine, grounds for holding that there exists some differences in animal fibre as to its liability to be formed into uric acid by the liver. Thus brown meat is more liable to produce a quantity of uric acid than is white meat. Why such should be the case, the physiological chemist has not yet any word to say. But is it a fact? the reader may exclaim. Certainly it must be admitted that the hypothesis cannot yet in any way be regarded as a fact capable of demonstration. On the other hand,

from conversations on the subject with some of the most eminent medical men, both at home and from the U.S.A., I have found my own private opinion much strengthened by what they told me. As to the solution and metabolism of albuminoids within the body, some seem more liable than others to "go wrong;" or to give rise to products which have a tendency rather to pass into uric acid than into urea. By the avoidance of these latter forms of albuminoids much formation of uric acid may be averted.

Such at least, are apparently, the lessons of clinical medicine. Then again caseine seems least of all the albuminoids to so "go wrong." All are familiar with the efficacy of a milk-diet in all, or almost all, cases of mal-assimilation or mal-nutrition, from babyhood to the decline of life. In certain cases of gout a dietary of lentils seems to protect the individual from the evil. Certainly when some well-nourished victim of chronic gout takes to Revalenta Arabica the result is often very satisfactory. There is nothing attractive to the palate to induce the patient to eat too much; possibly that is no unimportant factor in the result. Then there seem grounds for holding that vegetable caseine, like animal caseine, has but little inherent tendency to go astray in the assimilative processes. One physiological fact there is, however, which stands in a suggestive relationship to the clinical data, and that is this—caseine is dissolved rather by the tripsin of the pancreas than the pepsin of the stomach; while animal fibre (and egg-albumen from which it is developed in the embryonic stage of life), is rather acted upon by pepsin. Whether caseine dissolved by tripsin

in an alkaline medium (Part I. pp. 50-1) is less liable to be formed into uric acid in the liver, than animal muscular fibre (mainly digested by pepsin in an acid medium), or not, is a matter upon which we can only speculate at present: but the lessons of practice tell us that there is an actual difference between the different albuminoids as regards their behaviour in the later digestive processes in the liver; and their liability to pass downwards into uric acid, rather than onwards and upwards to the perfect albumen of the liquor sanguinis. The reader, however inclined to regard this hypothesis as too purely speculative, will do well to think the matter carefully over! However defective the hypothesis may be, the clinical observation that white meats and caseine suit gouty individuals better than those forms of animal muscular fibre, conventionally spoken of as brown meats, remains valid.

Consequently then the first parallel in our attack on the formation of uric acid is to limit the amount of albuminoids taken daily. Probably it is not immaterial what forms of albuminoid food are preferred.

Inseparably blended with this matter is the subject of hepatic stimulation.

Do we possess agents which stimulate the liver, and increase its activity in the metabolism of albuminoids?

Certainly; we do possess such agents. There seems no question about this. Just as mercury and sulphate of soda cause a quantity of bile to be thrown off by the liver; so in certain agents we have stimulants which increase the activity of the gland in its other function, *viz.*, the metamorphosis of nitrogenous materials. They are

ipecacuan, euonymin, iridin, baptisin, aloes, and rhubarb. Probably general nervine tonics as strychnia also act upon the liver. The reader may not be prepared to go with me here: I cannot help that! "A man cannot leap from his shadow. Neither can he divest himself of the lessons of his own personal experience" (Chronic Bronchitis, p. 130). The experience of the last few years has convinced me, at least that we can exercise an influence, and in many cases a potent influence, upon the function of the liver in the assimilation of albuminoids by the administration of hepatic stimulants. The observations of modern physiologists and those of experimental therapeutists join hands on this matter; and in our increased acquaintance with the processes which go on in the liver, and with the action of drugs upon that viscus, do we find our increased power to deal with the formation of uric acid; as compared with the limited power of even our immediate predecessors. They had already seen how the avoidance of animal food affected the development of gout; they had acquired definite views of the value of potash as a solvent of uric acid. We possess more precise knowledge on the first subject. It is not only the quantity of albuminoid matter which is consumed, that is of moment, the form of albuminoid is not immaterial. Further, we now possess agents by which we can stimulate the function of the liver in the metabolism of albuminoids. And in these last we are stronger to deal with gout than even the generation just passing away. The utility of ipecacuan in improving the assimilation was known in the last century, and ipecacuan was a

constituent of the "dinner pill" in vogue long ago; which consisted of aloes, ipecacuan, and cinchona. Such pill was later on called by Kitchener a "peptic persuader;" and while admitting that ipecacuan does increase the flow of gastric juice, still it is also a potent hepatic stimulant. Consequently in cases of gout with impaired assimilation and nutrition, a dinner-pill of strychnine, ipecacuan, and a little black pepper in extract of gentian or taraxacum, (if no purgative action be indicated,) or in aloes and myrrh, or compound rhubarb pill, where some action on the bowels is desirable, will often prove of the highest value. Under its influence the patient improves materially in all respects.

Where there is a good deal of constipation and a bad taste in the mouth in the morning, it is well to prescribe some sulphate of soda with Rochelle salts, or some purgative water, to be taken in warm water. Especially are these measures indicated where there are deposits of lithates in the urine. Or even a pill at bedtime containing some mercurial may at intervals be ordered with advantage, with the alkaline saline draught or water next morning.

Such, indeed, constitutes the medicinal regimen of gouty patients when below the ordinary level of health, to be pursued systematically.

Then as to the "gouty dyspeptic," a very difficult patient to manage. Here it is necessary to keep the primary digestion in mind, as well as the secondary digestion in the liver. The food must be adapted not only to the needs of the system and the power of the liver;

but also to the capacities of the primary digestive powers of the stomach. The reader will do well, at this point, to reperuse Chapter XII., Part I., in order to grasp the main lines of the dietary; and then to study "Food for the Invalid, the Dyspeptic and the Gouty" for the practical management of each case. Further experience corroborates the views given elsewhere as to the choice of food, and the qualities it should possess. Especially is twice-cooked food to be forbidden. However savoury the skill of the cook may succeed in making it, twice cooked food is not acceptable to the dyspeptic, whether also gouty, or not. The utility of artificial digestive agents is further and further demonstrated by time and experience. Not merely taking the agent when discomfort is developed; but taking pepsin, in fluid, powder, tablet, or pill in the middle of the meal is very useful. More perfect gastro-intestinal digestion is a matter of moment; the more perfect the resultant peptone the less likely is it to pass downwards in the liver.

Consequently the use of artificial pepsin, or artificial pancreatic secretion is a great addition to our modern armamentarium in dealing with the production of uric acid. The combinations of the different digestive agents now in vogue, containing the ferments of the saliva, stomach and pancreas, all in one, are unphysiological in their disregard of the various periods and localities of the digestive act, but, nevertheless, on the "pot-hunting principle"—i.e.: "if one misses the other hits" according as the contents of the stomach are acid, or neutral, they are not without value.

Emulsions of oil of various kinds are now to be procured, which may be taken when gastric digestion is being terminated and the contents of the stomach are passing out into the bowel, i.e., from an acid to an alkaline medium. This takes place, to speak broadly, from two hours after a meal of digestible food, to a longer period after a less appropriate meal. To emulsions of oil or fat may be added the pancreatic preparations now readily procured.

It is, in my opinion, in these matters of digestion, choice of food, hepatic stimulants, and artificial digestive agents that we are now more potent for good than our predecessors were in the treatment of lithiasis; and that we can agree with Sir Charles Scudamore—"Under the artificial condition of man in social refinement, nature is not always able (and seldom indeed permitted) to employ the wisest, shortest or safest methods of cure. I trust that we are paying her sufficient respect in attentively seeking to discover the kind of evil, she has to remedy; in taking all her indications for our guide, and acting truly as her servants; but not with *fettered hands*." Our hands indeed, are much freer now, than were his who spoke so wisely according to the light of his generation. We have, indeed, to follow, not to traverse, nature's processes; to help the natural efforts, not to try to institute some new process. And for such end we now possess many means unknown to those who went before us.

2. Uric acid solvents, and the resort thereto. The resort to acid solvents is a means of attacking gout which may fairly be termed the second parallel, in the language of the military engineer.

Uric acid is sparingly soluble; and as the urate of soda, or ammonia, or even as free uric acid, does not readily find its way out of the kidneys. To render it soluble we administer potash or lithia, with which it forms the soluble urate of potash, or lithia, and so finds its way readily out by the water emunctories of the body, and especially the kidneys. Alkalies, as *antacids* have been in vogue for some time in the treatment of gout. Morgagni speaks of limewater with soap dissolved in it as a remedy for gout! Potash was used by Scudamore in the treatment of gout. He seems, however, to have used it as an addition to the sulphate of magnesia, as an antacid.

To his favourite draught of sulphate of magnesia, carbonate of magnesia, and vinegar of colchicum, he added carbonate of potash "when the deposition of pink sediment is abundant." No doubt his experience of potash in cases with pink urates was encouraging. Even Pereira recommends potash as "an antacid in dyspeptic affections; as a diuretic, as an antacid in that form of lithiasis which is accompanied with an increased secretion of lithic acid, or lithates," without, apparently, any very clear views as to its utility as a solvent of uric acid. Prout says of alkalies, that their utility is "to counteract the acidity of digestion," and prefers to give the alkali from two to six hours after a meal, usually from three to four hours. For such purposes "from ten to twenty grains of the carbonate of potash will, in almost every case, be found amply sufficient." He goes on to say next, "which in fact is all the real good that can probably be expected from the use of the remedy." Potash he prefers to magnesia as an ant-

acid, except when the acidity is far down the bowel, in the cœcum or colon. He also knew that alkalies had been used to dissolve concretions in the kidney or bladder with success. He observed how some persons cannot tolerate alkalies as compared to others; how some alkalies only disagree with other patients; and how much mischief the resort to alkalies in excessive quantities causes in certain cases. While admitting the usefulness of alkalies in lithic acid deposits, he wisely adds—"Yet it must be borne in mind that their operation is not of a curative, but of a corrective nature only;" a remark which has lost none of its primitive value by time. Garrod says, "If there be a deficient secretion from the kidneys, the salts of potash are desirable, on account of their diuretic properties; added to which, they possess great solvent powers for urate of soda, and I am fully convinced that this latter property plays a most important part in the therapeutic action of the drug." To Garrod, indeed, we owe most of what we know about the important subject of uric acid solvents. He it was that took practical advantage of the discovery of Lipowitz as to the affinity of uric acid for lithia; Ure having advocated the use of carbonate of lithia in injections into the bladder to dissolve uric acid calculi. Even gouty concretions in the hands have been got rid of by the use of this solvent. It may be given either as the carbonate, a powerful alkalising agent; or as the neutral citrate. Garrod thinks lithia may be continued for a much longer period than potash without injurious effects. Certainly in some persons the continued use of potash is decidedly deleterious. Too great doses

of lithia, however, when continued for some time, produce dyspepsia. Phosphate of ammonia and phosphate of soda also are solvents of uric acid which are now little used.

The practical application of uric acid solvents are two.

(1) To clear the system of excessive accumulation of uric acid in paroxysms of acute gout; and (2) to neutralise and remove the daily production of uric acid. The first will be discussed in the next chapter.

The second demands our consideration here. The production of uric acid by the liver is a more or less regular process. We have considered how this may be largely avoided by suitable food and hepatic stimulants, in a previous section. Any quantity of uric acid still produced by the liver despite these measures has to be dealt with. The most rational plan, and in my experience the most successful, is to meet this daily production by a daily dose of some uric acid solvent. The proper time for this is when the stomach is alkaline, that is before a meal. The best time is on getting out of bed in the morning. Granular citrate of potash may be the form used, and a teaspoonful drank while effervescing in half a tumbler of water. Carbonate of lithia neutralized by lemon juice, or lime juice, and drank effervescing, others may prefer. My own preferences lie with some citric acid in a tumbler three parts full of water, and an equivalent of carbonate of lithia, bicarbonate of potash, and bicarbonate of soda mixed—the latter to be added and drank while effervescing. Such agents form an agreeable beverage, and call for that draught of water so desirable to “bathe the tissues” when fasting, and before any food is

taken. As a hygienic and prophylactic measure for the prevention of gout, it seems impossible to rate this scheme too highly. Plenty of water adds to the efficacy of the alkalies, as all agree.

Now a word as to the adoption of these uric acid solvents. They do not seem so well suited to the pale white sediments produced by indigestion, as urate of soda, as to the redder sediments of pyrexia, and other conditions, as the urate of ammonia. When pink lithates are present these solvent alkalies are clearly indicated; with a mercurial pill occasionally at bedtime, and an alkaline saline draught in the morning to "flush the sewers;" especially in persons of full habit. In imperfectly nourished persons with defective digestion, such plan is decidedly too lowering in most cases. Each case of lithiasis then requires its own appropriate treatment according to its indications, and the medical man's capacity to read them aright.

The resort to the solvents of uric acid has to be conducted on rational principles; which do not include taking some potash or lithia in the water drank at meals, as some elderly females of both sexes choose to take them. Of course they are not utterly useless taken at such times; but during the natural acidity of the stomach in the digestive act is not the proper time for the taking of alkalies.

The use of alkaline waters as a mere beverage when thirsty, or as addition to wine, or spirits, or cyder, has to be conducted on the lines here laid down. Potash, or lithia water, with some alcoholic fluid at bedtime, or to a

cigar or pipe in the evening, often agree very well with gouty subjects of active habits.

When the tissues are infiltrated with gout poison, then the addition of iodide of potassium to the bicarbonate of potash is eminently useful. Under its melting influence the urine becomes high coloured and dense, of higher specific gravity; while the subjective sensations tell of the good it is doing. In chronic and subacute gout iodide of potassium is a most potent agent in the solution of uric acid. Given with some bicarbonate of potash, and well diluted, the deposits of urates in the tissues are dissolved, perhaps not entirely in any case, but sufficiently to give pronounced relief. In early attacks of gout, before chalk formations are apparent, such medicinal measure is most effectual; after chalk formations are established of course the effects are less complete.

The rational use of uric acid solvents, which we owe to Garrod, marks a great forward movement in our capacity to deal with lithiasis in all its forms.

Closely linked with this aspect of the treatment of gout comes the matter of improved oxidation.

The lithiasis of the pallid, sedentary city man, who lives habitually in an atmosphere of rebreathed air, deficient in active oxygen, requires for its successful treatment fresh air. Alkalies are best suited for the plethoric of active habits, the full-fed country squire for instance, and are as a rule contra-indicated with spare pallid men; so these latter do best with plenty of fresh air, either in the country or at the seaside. Such patients, indeed, do well at the different sanatoriums now established in many healthy

localities. With a quantity of fluid first thing in the morning, and some exercise to quicken the action of the sweat glands, such patients soon begin to improve materially. To wash away the waste is the first step, after which follows the laying down of new tissues. The following description of such form of gout by Barlow is very life-like. Of its *semieia* he says—"These are a sallow aspect and dusky skin, the pulse low, soft and easily compressible, the surface of the body for the most part harsh, dry, and obviously deficient in natural transpiration; the tongue moist, clean, red; the appetite capricious, often craving, with an endless train of dyspeptic ailments; the alvine discharges inveterately foul, dark, slimy, pitch-like, and exhibiting no traces of healthy fæces; the urine high-coloured, often foetid and depositing more or less of sediment; these several evidences, or a certain portion of them, with decline of flesh and strength, are sufficiently characteristic of this state." Such a gouty individual requires the hepatic stimulant pill (p. 190) and some alkaline saline purgative occasionally; but instead of a daily dose of alkalies he requires fresh air and exercise; and if his tongue remain coated with fur some nitro-hydrochloric acid in a bitter infusion. That is the particular regimen called for by the exigences of his condition.

3. The Palliative Treatment of Gout. This is a matter which requires some thoughtful consideration. Of old opium was given freely in gout. Purgatives with anodynes formed the treatment *par excellence* with most. Cullen advocated the free use of opium, and Dr. Sutton thought small doses of little use. Scudamore points out

what large amounts of opium are not only tolerated but called for in the severe pain of acute paroxysms: but it must be withheld when the pain ceases. He observes, however, "there are some instances of particular idiosyncrasy of constitution, in which the medicine cannot be borne in any form." Other anodynes and narcotics were to be tried in these cases. Hyoscyamus, lupulus, lactucarium, all were used in those cases where opium disagreed. He learned, too, that however much opium might seem indicated in acute kidney troubles, as a renal calculus, it was well to be cautious. "Experience shows us that the effect of opium very usually tends to keep the secreting function of the kidney, when it is under inflammatory irritation, in further restraint, even although it be used in combination with purgatives." We cannot be too careful about the resort to opium in cases of kidney trouble. Its use is apt to end in the establishment of uræmia. In uræmic diarrhœa, with suppression of urine (more or less complete) opium must on no account be used. Indeed, when there are evidences of renal embarrassment, as some albumen in the urine, opium must be withheld in common prudence; though at other times it may agree with the gouty patient quite well.

At the present day we would prefer to give full doses of the bromides to gouty patients, with or without hyoscyamus. Where there is the gouty heart and a tense pulse, then chloral hydrate is of great service. But if the pulse be not tense it must be used guardedly. Some chloral with bromides often relieves the restlessness of gout very satisfactorily. But as an analgesic, giving

relief from pain, opium stands first *longe intervallo*—but then there is the risk attached to its use.

The next agent to be considered is colchicum: an undoubted palliative in gout.

About this agent it is impossible to have clear views without a historical survey of gout, as regards its treatment. Colchicum, or meadow saffron, is supposed to be the Hermodactyl of the Ancients, in great repute for the assuaging of the agonies of gout.

The treatment of gout from the time of Galen to that of Sydenham consisted essentially of the use of bitters and aromatics. The drugs most in use were angelica, wormwood, the lesser centaury, elecampane, germander, and ground-pine. Such formed the leading or main constituents of Sydenham's drinks; flavoured variously with vegetable agents or spices. They were drunk freely and continuously. A famous powder was in great vogue in the second Duke of Portland's time (the beginning of the eighteenth century); and he, from the benefit he had received from it, bought the secret of its preparation, and gave it to the public. It closely resembles Sydenham's concoctions. "It consists of equal parts of the five following materials, finely powdered and intimately commixed: birthwort, gentian, germander, ground-pine, and the tops and leaves of the lesser centaury." The dose was a drachm every morning for three months; two scruples the next three months; then half a drachm; at the end of the year this last dose every second morning for twelve months, "by which time it is presumed that a cure will be accomplished." Perhaps the regimen had

much to do with the result. In time, however, doubts arose as to the real benefit derived from this famous powder; and Dr. Cullen investigated carefully the history of a number of gouty persons who had taken this powder, and found that all succumbed to some form of dropsy in two or three years after their "cure." The investigations of Drs. John and James Gregory were to the same effect. So the Portland powder went out of fashion; and Cullen's practice was "committing the person to patience and flannel." He, however, used opium internally and externally, with purgatives.

"Patience and flannel" was next the routine treatment of gout; which was, it boots not to say, a slow and painful cure. At this stage M. Husson's "*Eau Médicinale*" made its way to the front: and Sir Everard Home introduced the wine of Colchicum into the London Pharmacopœia. That colchicum gives great relief in gouty attacks is certain; and its immediate good effects are readily observed. It was, indeed, regarded as a "specific remedy." Sir Henry Hallford read a paper on the use of colchicum in gout before the College of Physicians in June, 1831. He placed his dependence upon it indeed; and preferred an infusion of the roots in sherry wine to any other preparation. Sir Henry Holland and others have advocated its use; and Sir Thomas Watson has made its employment universal. Sir Charles Scudamore tried it extensively, and found "It has afforded palliative relief to many persons; for a time to their satisfaction: to a few more permanently." He goes on to say of Wilson's Tincture very much what Garrod has said of

Laville's: "I could relate almost an infinity of cases in which this tincture has, after a time, entirely disappointed the hopes of the patient, and has given him more or less cause of regret that he has depended on its palliative relief." He held the early good effects to pass away in time, and the evil effects to show themselves. Dr. Parry thought with him as to the *eau médicinale*—"In the majority it has eased present sufferings at the commencement; has not diminished the actual quantity of inflammation; and in process of time has disappointed the patient as to its present effects." As to the bad effects, Scudamore says: "The *eau médicinale* has been the fruitful source of many cases of chronic gout, by enfeebling the nervous system; and occasioning, together with irregular pain and obscure inflammation, a degree of despondency and languor never before experienced."

Todd thought colchicum might be given in sthenic gout, but disapproved of it under other circumstances. He held it often got the credit of "cures to which it had no claim." Gairdner advocated small doses. It was thought that colchicum increased the amount of urine solids, but Garrod has disposed of that hypothesis. Garrod says, "Colchicum has a specific power over true gouty, articular inflammation, and may be given with advantage under such circumstances. It seldom fails to allay quickly all inflammatory symptoms, without the necessary production of any sensible physiological effect." Further he holds, "When colchicum is carefully prescribed, it has no tendency to lessen the intervals between the gouty paroxysms, or to render the disease

chronic in character." He admits, however, the evil effects of long indulgence in Laville's tincture, which he holds "owes its efficacy to the presence of colchicum."

My own view is that colchicum has an unquestionable power of allaying gouty inflammation; but that the game is not worth the candle: the relief being furnished by arresting the inflammatory process which clears the system, and caused Mead to say, "Gout is the cure of gout." Consequently I discourage resort to it among my private patients, and eschew it myself; though perfectly willing to prescribe it to an artizan at the hospital who must have immediate relief, because he has a wife and family depending on him for bread. When the agony of gout is great—and it can be intense—no doubt the natural instinct is to court relief even at the expense of the future. But in prescribing colchicum I think it is but fair to explain to the patient that many a gouty person has come to regret the resort to this powerful assuaging agent. Probably it is less injurious when merely given in an acute paroxysm, than when habitually taken to stave off gout. It is this last use of it which is, in my opinion, so injurious. Having thus put the *pros* and *cons* before the reader, he must exercise the right of private judgment about his use of colchicum. Garrod thinks that the use of ash leaves for gout, a French practice, is worth trying. An infusion of them has given much relief in some cases. But little is known on the subject.

Iron has always been in favour for atonic gout, as it has been for atony under all circumstances. Warren,

who wrote on gout in 1768, was very fond of iron, and held it of great value, indeed, the most powerful of "the Medicines which expel the gouty matter to the extremities, which is the only method by which the cure can be completed." His "Steel powders" were made from iron rusted by urine and washed. The use of iron in gout requires discretion; as it certainly makes some cases worse and not better. It is useless to give iron while any active symptoms remain; or while the tongue is either red and irritable, or coated with fur; when the *primæ viæ* are restored to full vigour, and the tongue is clean and normal in all respects, then steel may be recommended. The neglect of these precautions causes not only much disappointment, but positively throws the patient backward. The administration of iron, like that of good food, requires judgment and discretion, lest it be a case of "the more haste the less speed."

Peruvian bark has always been in favour as a tonic in gouty debility; and more recently quinine. Still later *nux vomica*, and its principle, strychnine, have found their advocates.

Having reviewed the various agents used in the treatment of gout, and attempted to appraise their exact value, it may be well to proceed to consider local measures and their utility.

As to surgical measures, such as clearing the tendons when a finger is brought down so as to free it; or of other matters purely surgical, they cannot be discussed here. There was a view that it was well, on the principle "let sleeping dogs lie," to leave gouty distortions and

fixtures alone ; but recently a feeling in another direction has sprung up.

As to ordinary measures, douching affected joints, and then rubbing them well with flesh gloves or brushes ; after that perhaps some passive motion ; all are permissible. But as to laying down any rules it is simply out of the question, beyond the broad caution to avoid anything like violence to joints where there is the strumous diathesis. Blisters will promote absorption ; and some croton oil liniment, or painting with iodine, may be serviceable in effusions into joints. Leather covers, or soap plaister, or an elastic cover may be useful at times. The external use of potash, or iodide of potassium, to reduce gouty concretions has been too little tried for anything positive to be said about it. Garrod has found lithia applied outwardly of service in reducing some gouty tumours. Liniments of various kinds may be used with friction, chiefly for their lubricating value. Iodide of potassium in compound camphor liniment is said, however, to have materially helped the friction at times.

Local applications, however, belong mainly to the treatment of the paroxysm of acute gout. As to the hygienic and prophylactic measures to be pursued in gouty cases, their name is legion. Only an outline can be sketched here ; which must be filled up in detail in each case according to its requirements, and the patient's means.

In the first place the dietary must be regulated. Parsimony must rule, and the quantity must be stinted in almost all cases. Abbé Cornaro lived for years on a

most restricted dietary with great benefit, and the full-fed gouty man can live on very little, if he will only try; vegetables, plenty of vegetable parenchyma as the leaves of the cabbage, lettuce, spinach, are what he should largely eat; for these allay the cravings of hunger without furnishing too much nutriment; of course such dietary is inadmissible with the dyspeptic.

Then fruit is desirable, either fresh or stewed. Of old, sugar was objected to with gouty individuals; but I am inclined to hold that vegetables and fruits are, as a rule, rather to be taken freely than eschewed by the gouty. Apples, pears, melons, bananas, oranges, peaches, apricots and nectarines; grapes, cherries, raspberries and strawberries, are unobjectionable (when they do not disagree); while the salts of fruits are decidedly good. Gooseberries, currants, red, white and black, and plums are, perhaps, less likely to agree, but with quantities of cream they can usually be well borne; and all sub-acid fruits are desirable. But oxalates are to be avoided, as sorrel, rhubarb, tomatoes—and to a less extent asparagus, and even broad beans. The oxalates so furnished irritate the brain, as Bence Jones pointed out, and also the urinary canal in some patients. Then as to cucumber, there exists no objection except for dyspeptics. Salads, indeed, ought to form a great portion of the dietary of the gouty. In winter the cabbage, the Brussels sprouts, leeks, Spanish onions, artichokes, and greens, as the leaves of the various crucifera, may be taken. Potatoes, cooked in various ways, are excellent, so is the vegetable marrow; turnips, carrots, and beetroot may be eaten; except by

those with whom sugar distinctly disagrees. The cauliflower is unobjectionable. But whenever the patient has learnt from experience that any one thing, or a number of things do disagree, they must be abandoned. No rules of thumb can override a distinct personal experience.

Then fish in all forms may be taken freely; though salmon, mackerel, herring and soles, when fried carelessly, are very apt to set up acute indigestion. A lobster salad is a typical dish for the gouty individual with a good digestion. This combines vegetable, oil, and meat in sufficient quantity. Where there exists impaired digestive power, then the farinaceæ are to be cultivated. Hominy in porridge, or in fritters, oatmeal porridge, the steam cooked cereals now to be procured of all grocers, are admirable for dyspeptic persons, whether gouty or not. Then milk puddings are good, especially with stewed fruit; and here a practical remark may be offered. An alkali has long been used by many cooks to neutralize the acidity of fruit when stewing, to economise sugar. Now this offers a means of introducing potash to a patient who will take no medicine. Of course the amount varies with the fruit and its acidity, but as "a sighting shot," it may be said a drachm of bicarbonate of potash to a pound of red currants is amply sufficient. The cook should taste the resultant product, and if any soapy taste exist then the alkali is in excess. Such an amount should be added, indeed, as will lessen, but not quite destroy, the natural acid flavour. Such stewed fruit can be taken with advantage by many with whom

stewed fruit disagrees when the acidity is masked by sugar only. Indeed, fruit so treated with potash is much more acceptable to the palate than that so heavily laden with sugar, for most persons. A little sugar may be added to bring out the flavour and cover the remaining acidity. Such fruit with cream or a milk pudding is eminently desirable for gouty persons with defective digestion.

Then fat in all forms is desirable, especially as butter and bacon fat. A rasher of fat bacon to breakfast with a little fish, followed by some fruit, is a suitable breakfast for a hale gouty man. For lunch a lobster salad, or some mashed potatoes and a glass of milk are sufficient in most cases. For dinner, soups made with some cream instead of some stock are to be preferred to those ordinarily prepared. White fish to follow; a slight entrée, and a scrap of game are quite ample. The joint should be passed; and for the entrée, sweet-bread, chicken, pigeon, or rabbit are to be preferred. Then some good sound fruit at dessert should be taken habitually. At supper, if the dinner be taken comparatively early, a light digestive biscuit is sufficient, or some farinaceous dish, with or without a glass of milk. Now such dietary may seem to some persons as insufficient for the body-needs, or as too starving, and that the patient must grow weak upon it; or, if weak, can never get strong on so poor a dietary. If they possess more knowledge on the subject than the writer, they are, of course, quite independent of him and his suggestions. But for those who have no such formed views, these remarks may serve as guides.

We are at present passing through a phase of "feeding up," and many maladies are the outcome thereof. A restricted dietary is really indicated; and the patient's strength cannot be built up in strict proportion to the amount he can be induced to swallow: or the quantity of beef converted into beef tea, or of gravy meat for the stock of soup. It is what can be digested, not only in the stomach and bowels, but in the liver, that we have to look to. All that is converted into urates is not only wasted as regards the nutrition of the body, but becomes positively mischievous.

The medical man will find in this matter that he has the greatest opposition to encounter from pre-existing impressions, especially in the feminine sex, who are eminently conservative; and with whom a starving regimen finds no favour. Their desire is excellent; but it is that excess of albuminoids which as urates irritate the kidneys, that has to be specially avoided.

Nor need the presence of glycosuria affect the dietetic treatment too much; as regards the passage of sugar through the renal vessels, it has not yet been proved that it exerts any more injurious influence over them than it does over those of the portal vein, through which sugar passes at every meal. But it is certain that the extreme meat dietary, to which diabetics have been condemned too exclusively in the past, does injure the kidneys. Many cases have come under my notice where the glycosuric patient seems to have suffered more from the dietetic treatment adopted than from the malady; and that was not only my impression, but had been that of the

medical men in immediate attendance upon the cases; formed quite independently, and before the cases had come under my notice. The reader must here understand that mere glycosuria does not always involve that more grave condition known as diabetes. Then as to obesity in gouty persons, the same remark holds good; they are not to run the risk of further injuring their kidneys by following the late Mr. Banting's example of an exclusively meat dietary, and the strict avoidance of starch and sugar as well as fat, from which much Bright's disease has sprung; but rather moderation in all food except vegetable parenchyma as vegetable marrow, with raw apples, in plenty; on which last a corpulent person can get along famously. The gouty, who are obese or glycosuric, are not likely to suffer from a spare dietary; but if the glycosuric wastes upon such a dietary, then some change is desirable.

Drinks are of moment too. As a broad rule it may be said that all gouty persons of thin flank should avoid malt liquors; while gouty persons of square abdomen may take them if they cut down the amount of animal food and eat accordingly. A poor wine suits the gouty best; except in some cases where the patient has been pulled down by a severe attack, and then a more generous wine and a liberal dietary may be most desirable, in order that the patient may get well quickly. "If you drink Wine you have the Gout. If you do not drink Wine the Gout has you," was the experience of Sydenham. Abstinence from all alcoholic drinks seems to suit many hale men who suffer from gout in their hands, and who cannot take sufficient exercise—as omnibus drivers, railway guards,

&c. Every man must be a law unto himself in this matter of alcohol; but his medical man can often help him materially to come to a decision. Effervescent wines, rich or generous white and red wines, are specially liable to produce gouty symptoms. Bad champagne or young port, no gouty man in his senses would drink. Graves, Barsac, Capri, a light Cape Constantia, light Hocks, if they be the product of the Rhine grape and not of some chemist's laboratory, may be drunk. The time to drink such wines is with a meal; drinking betwixt meals is bad. Others again may find a little old spirit with some water, plain, or effervescent, to suit them best. A little whisky, Irish or Scotch, or some brandy, with water, at their meals, helps them to eat and digest; but it is obvious that such fillip to the appetite and the digestion is scarcely required with most gouty subjects. Say that the patient is a lady, about the change of life, where there is a weak, dilated heart, and then such a deviation from the ordinary treatment of gout becomes not only permissible but desirable. To such apply the arguments of Stokes—"It is necessary that wine or some other diffusible stimulant should be carefully administered, and the system supported by a proper aliment; for there is nothing more dangerous than by any interference with the usual habits of the patient to reduce the strength in these cases."

The use or avoidance of alcohol in each case is a matter for careful thought, and therefore any dogmatic statements are to be avoided in a treatise dealing with the subject at large.

Then as to clothing. As a rule the gouty when ordi-

narily in good, indeed in rude health, except when the paroxysms are actually upon them, require light clothing. They are given to feel too warm; readily find an excuse for cooling themselves; throw off their coat, or overcoat, on any pretext; and get "fidgets" if too warm in bed. But as time wears on it is well to wear a "cummerbund," a flannel belt worn round the loins, covering the liver and kidneys, so as to protect them from any chill to which the body generally may be exposed. By such means the important parts are protected, and where there is any tendency to biliousness or indigestion, the gouty man will do well to take to this Eastern garment. The clothes should be light and yet warm. Good merino underclothing from the neck to the wrists and ankles is most desirable with both sexes; yet it is difficult to induce ladies to adopt this "second skin." When exercise is interfered with by any crippling of the feet then the matter of clothing becomes very important. If a gentleman, he may get a cob and jog along at such a pace as will keep him warm; but with a lady she must adopt carriage exercise, and in cold weather it is almost impossible to have too many "wraps" when driving. For a lady a wash-leather bodice; if a gentleman a seal-skin waistcoat, well lined or quilted at the back, is desirable. Both should wear furs. Ladies most willingly obey orders in this respect; but gentlemen do not readily fall in with this view. Yet one patient, a gentleman who had a great deal of railway travelling early and late in the day when it was cold, was induced by me to invest in a warm fur-lined coat and long boots before the severe winter of

1880-1, with the result that he has not required any consultations since.

Any check to the action of the skin produces such vascular fulness of the kidneys that such causes of congestion should be scrupulously avoided; while the function of the skin as an eliminant of urea is worth fostering when the kidneys are no longer in their functional integrity. When any albuminuria is present, all ordinary precautions ought to be redoubled.

Then the habits of the individual should be regulated accordingly. It is not good for the gouty to spend many hours of the twenty-four in a vitiated atmosphere, whether in places of business or amusement; whether at home or at the club, in the billiard-room or the whist-room. Ladies should avoid heated rooms; balls, concerts, theatres, or even too warm living rooms, especially after dinner. Stouter under-clothing would enable them to live habitually in cooler rooms, which would be infinitely better for them; and would help to diminish "the imperfect oxidation factor" in their lithiasis; a factor more constant with females than with males, when the victims of gout.

Locality. This is a matter which affects the affluent mainly. The poor must reside where their calling decides. But what is said here applies to the latter, if their calling will permit of their changing their residence. Low plains rarely suit any case where the functions of the liver are disturbed. In London, for instance, the gouty individual should prefer "the Northern heights" and their slopes, or the Surrey hills, to Brixton or Bed-

ford Park, or even Belgravia. Then again he should prefer a suburb where the air is fresh, to a town where manufactories and long chimneys tell that the oxygen of the atmosphere has been largely taken for furnaces, leaving little for human lungs. If in the country he, and still more she, should avoid damp localities, as the valleys of the Rhonda district for instance, or the dales of the northern mountain districts; and valleys like that of the watershed of the Wash. They would find themselves better at such places as the Undercliffe in the Isle of Wight, for the sea does not give rise to damp like wet marshy land; or at Malvern, where the bracing atmosphere of a hill is tempered with that of a rich alluvial plain around the hill. In both localities there is the great advantage of a view which relieves the patient from ennui or a sense of monotony. Then the slopes of the south downs are admirable, for the chalk water runs swiftly away from the hill sides. In summer, Buxton, Matlock, Harrogate, Ilkley, are typical residences; but they are too chilly for the gouty in winter. Then Leamington is a medium place, lying near the centre of England; it is not too low for summer, nor too exposed for winter. Cheltenham is a winter resort, and so is Bath. In the days of the Romans "Bath was then, as in later times, the fashionable resort of the gouty provincial" (Green's *Making of England*), just as in summer the Normans went to Buxton. In mentioning the above places, it is not suggested that they, and they only, are the resorts for the gouty invalid; they are given as instances of various localities for different seasons, with which all are familiar,

and so serve as guides to the choice of other localities less well-known. Many localities have been selected as health resorts on account of their possessing springs of mineral water, useful in various complaints. Thus Buxton, Cheltenham, and Bath have waters which are not without value. Sometimes the waters agree, sometimes they disagree. No rules can be laid down, except by a competent medical adviser familiar with the wants of the patient. It is instructive to read what the older writers had to say about the effects, good and otherwise, of waters, especially the Bath spring.

There is the question of their internal use; and then that of their external use. Of the first it may be said that draughts of water, pure or impregnated with various salts, cold or warm, taken in the morning fasting, are better suited for robust individuals suffering with articular gout, but free from dyspepsia, than to cases where the digestive and assimilative organs are impaired. They are indicated where the tissues need bathing. Persons (and consequently ladies always) who take too little fluid with a certain liberality of food, are almost invariably benefited by a course of waters. Then as to the bath; if the hot bath leads to free perspiration, it is likely to be useful to plethoric persons. As to the cold bath, its use must be regulated by the well-known hygienic rules about bathing. For instance, not to indulge till chilled, so as not to react readily in a subsequent glow; not to have a bath first thing in the morning, if not very strong, but to take breakfast, and bathe about eleven, &c.

The same rules given above apply to foreign watering

places and waters, as Vichy, Carlsbad, Wiesbaden, Baden Baden, Homberg, Marienbad and Kissengen, with many others less known, as Contrexeville. According to their constituents so must they be used. Then there are warm waters and sulphur springs, of which much might be said, if space permitted. These are matters for special consideration in each case. Nor must the amount of amusement, or the prospect of pleasant acquaintances be forgotten. The telegraph has greatly reduced the value of health resorts for business men; for they cannot now lay aside their business cares as they could in by-past days, when they could be sent out of practical reach of letters, and, with them, worry. Men cannot now flee from their cares as they once could.

Garrod's summary is: "The waters should be selected according to the nature of the case. When the patient is robust, and of full habit, the alkaline saline springs; when torpidity of the bowels predominates, the purgative waters; when there is a want of vascular action, the saline waters; when the skin is inactive, the sulphur springs; lastly, when debility prevails, then the more simple thermal waters should be chosen." These are excellent broad rules, and it would be foolish to attempt more precise instruction. The danger is rather for the patient to go in for the water too much than too little.

While the treatment of gout is abstinence, still in the convalescence of an acute attack it is well to avoid reducing the patient too far. On this Scudamore is clear; Budd speaks out in no uncertain tones, especially as to wine; while Gairdner says of the lowering plan,

"If long persevered in, and not carefully watched, the accidents of atonic gout, in its anomalous and metastatic forms, too surely show themselves, and it is not an easy matter to remove them;" while Garrod holds with Sydenham that too great abstinence weakens the parts, and prevents their recovery, and that "in chronic gout the rigid diet, so necessary in the acute paroxysms, must be replaced by one capable of supporting the strength of the patient;" adding, "but as all nutriment which exceeds this is productive of injury, there is no little difficulty in correctly apportioning the food." It may be said on this subject: (1) for the prevention of gout abstinence is requisite; (2) in an acute attack a rigid dietary is indicated; (3) in convalescence a more liberal regimen is permissible, and even desirable; but (4), when the normal state of health is regained, then abstinence should be once more the rule.

Then there are some matters to be attended to of a more special character.

When the heart is acting irregularly it is well to weigh the symptoms carefully. If there be irregularity of action with tense arteries, indicating an excess of waste nitrogenous matter, then uric acid solvents with a mercurial pill, every second or third night, followed by an alkaline saline draught in the morning, will do far more good than digitalis. When the heart-muscle is faltering, then digitalis is clearly indicated. When potash or lithia is too lowering, it is well to give a little digitalis or nuxvomica to correct this. These broad rules apply to all cases.

Then there is the question of gouty affections of the respiratory organs. Gouty bronchitis has its own requirements, as carbonate of ammonia, with iodide of potassium, and serpentaria in its early stages; and carbonate of ammonia with *nux vomica*, with or without a little *digitalis*, as the case may be, when the secretion is well established. Dr. Peter Hood speaks wisely here. He says, "To stifle cough by anodynes is in such cases always dangerous and often fatal; and the treatment most conducive to success will be the employment of expectorants with alkalies, together with measures for relieving hepatic congestion, and for maintaining such catharsis and diaphoresis as the patient will bear and the case requires."

When the pain is severe the patient may become delirious. It would scarcely be wise to administer a free dose of opium if the pulse be bounding, without some tartar-emetic or James's powder. A mixture of opium with chloral may also be indicated by a full pulse: but where any suspicion of the integrity of the walls of the heart exists, then such potent medicines should be prescribed with great caution. Bromide of potassium with a little chloral is the combination to be adopted as a rule; but if intense pain be present then opium, the sheet anchor of the older physicians, must be used—with proper precautions of course.

Diarrhoea too requires astringents that do not arrest too much the action of the kidney, as perhaps tannin does. A little sulphate of copper possibly will suit best. When the diarrhoea coexists with a brown tongue and

defective renal secretion, then it is apt to be uræmic; and under such circumstances it is wise to avoid opiates and vegetable astringents; to use a little iron with some potash, (as the perntrate of iron and nitrate of potash,) to place hot poultices over the loins, and diet the patient on whey, or milk and soda water; that is to encourage renal action, and then the diarrhœa stops. But not to attempt to stop the diarrhœa till the kidneys are once more in action. Free diaphoresis by warm baths is useful.

The same line of treatment (leaving out the astringent medicines) is indicated when albumen is present in the urine. When albuminuria is present it may tell of two different conditions: (1) that there is some passing trouble in the kidney; or (2) that the peptones of the digestion are not turned back into proteids in the portal vein or liver (Part. I. p. 219), and so are escaping through the kidneys. In either case it is well to avoid any excess of albuminoids; as in the first case they further tease the kidneys, in the second they are but wasted. When albuminuria is present in a gouty case it taxes all the skill of the medical man to determine its significance: but as regards the case itself, it is clearly his bounden duty to give the kidneys physiological rest by limiting the albuminoids in the dietary, and rousing the skin into vicarious action for the kidneys.

Then there are skin affections of gouty origin. Persisting eczema is the commonest of these; then herpes, and prurigo. It is well to use alkaline lotions externally, and uric acid solvents internally. They "are for the most part, when occurring in the gouty, distinctly forms

of gout; and will be found either to require treatment addressed to the disorder, or else, if they yield to such remedies as arsenic combined with local applications, to leave, in many cases, far more mischief behind." (P. Hood.) This writer thinks any cure of the skin-disease, "which was an outlet for discharges," is highly dangerous unless the greatest attention "afterwards be paid to the state of the general health and to the functions of the great emunctories." Dr. Duncan Bulkeley is of opinion that alcohol is deleterious in the skin affections of the gouty. He says:—"It is a matter of continual experience to have patients state that all kinds of alcoholic drinks are followed by great aggravation of their skin symptoms." He thinks, however, that alcoholic drinks which contain saccharine matter, as sweet wines and malt liquors, worse in this respect than pure alcohol diluted. He holds the treatment of gouty skin diseases to lie mainly in the treatment of the gouty cachexia upon which they depend. A mercurial pill, with an alkaline saline purgative to follow, meets with his approval. Alkaline baths of the bicarbonates of potash and soda, with borax, he thinks of great service. As to the douching of gouty joints or eczematous limbs at certain baths, it is a matter rather for the local medical man at the bath to determine in each case than for any rules of thumb.

Retrocedent gout. This expression is used to indicate the suppression of some external manifestation of gout, and, simultaneously therewith, the supervention of some internal disturbance. It may be enteritis, which may be fatal, or attach itself to the stomach, or the heart. "The

symptoms which attack the stomach are exquisite pain and spasm; and sickness is an usual attendant. If the intestines be more distinctly affected, enteritis in its worst form is produced; and vomiting, which most commonly occurs, is more or less urgent, according as the seat of disease is near or distant from the stomach. In either case the danger is pressing; and unless relief be speedily rendered, death soon closes the scene." (Scudamore.) Or the heart may be the seat of the metastasis. Sense of oppression may go on to apoplexy if not relieved. Cullen thought syncope the result of gout receding to the heart, and asthma when receding to the lungs. Or it may be to the prostate with strangury, or to piles. Or it may be tic. Such retrocedence is usually the result of exposure to cold, or of cold applications applied to the extremities. There is acute inflammation set up, which may go on to gangrene, as observed by Morgagni, and others since. When such an untoward effect occurs, then alcohol with opium has been the time-honoured treatment. Hot applications are recommended. If there be some question of indigestion, then an emetic, followed by a purge, is the line to be adopted. When the retrocedence is of a less acute character, then the development of gout in the feet often gives quick relief. Whether acute inflammation of the heart ever occurs Garrod is in doubt. He says of retrocedence to the heart:—"That it is frequently spasmodically affected is certain, and probably in most of those cases of retrocedent gout which have proved fatal, some cardiac mischief, as valvular disease, dilatation, or fatty degeneration, had existed previously." Nitro-glycerine certainly

seems indicated where the heart's action is depressed. Garrod thinks gout rarely affects the respiratory organs unless some structural mischief pre-exists. Of course, asthma is not dependent on such morbid change; and gouty asthma is not uncommon. Gout in the eye, or larynx, or fauces, or testes, requires the general treatment of gout. Then spinal disturbances are not unknown along with gout; but it is not yet possible to say, or to deny, that acute disease supervening upon old standing mischief in the cord is due to gouty metastasis.

Warmth to the extremities is most desirable whenever gout is threatening the viscera. Such, then, is the management of the various phases of gout; the more chronic as well as the retrocedent forms belonging thereto.

Now something may be said as to the treatment to be adopted when certain morbid outcomes of the gouty state have been established. We know that in time the arteries become rigid, giving rise to apoplexy and aneurysm; that the heart first hypertrophies, and then begins to undergo fatty degeneration. During all this time vaso-motor disturbances occur, the gravest of which is angina pectoris. Here there is general spasm of the arterioles, involving those of the heart itself in all probability, and the heart's action is impaired, so that when the muscular walls are advanced in degeneration, the heart may stop in diastole. Here it is well to give nitrite of amyl, or, perhaps, better still, nitro-glycerine. Belladonna is also indicated, and is most useful in all such disturbances of the heart linked with arteriole spasm. When the condition is recurrent, then a rigid dietary, and medicinal measures calculated

to sweep the waste matter out of the blood are indicated; and if the heart is feeble, some digitalis. When there is arteriole spasm, with pulsation of the larger arteries, as the carotids, with palpitation, the directions given above are to be followed; both the immediate and the more persisting.

Then, as the case wears on, other difficulties and troubles reveal themselves. A trace of sugar begins to show itself in the urine; a matter of the worst prognostic omen, especially if at the same time the old gouty person begins to waste. It is useless here to weary the patient with the regulation diabetic dietary; milk with seltzer-water and quantities of alcohol are indicated; but the stomach, the palate, and the liver have all to be consulted. A little beef-tea with cream is good when it is fancied. Tea or coffee with good cream or the yolk of an egg, with a little toast and butter may be taken. Almond bread, if it agrees, certainly.

Then albumen shows itself fitfully at first. It is the herald of coming disaster usually. It may mean peptones slipping out through the kidneys; or some acute kidney trouble; or, worst of all, failure of the circulation and venous fulness. When the latter, the amount steadily increases with the venous engorgement. Any means which will fill the arteries and empty the veins will relieve the general condition; and, along with it, the amount of albumen, its outcome. Digitalis, strychnia, and carbonate of ammonia, given steadily, with nitroglycerine, when attacks of cardiac dyspnoea come on; purgatives to carry away so much fluid, are all indicated.

When œdema shows itself these measures must be pushed ; and, if necessary, pricking the extremities may be adopted, either with lancet, or needle, or still more comfortably, if perhaps not quite so efficaciously, Southey's tubes. If the legs weep well, then the plan is succeeding ; but if no escape of fluid follows this line of treatment it is to be abandoned. My strong personal impression is that incisions are much more successful in cases of anasarca where there is old standing renal mischief, than in those which are purely cardiac.

In cases of old standing gout it is quite common to find the patient liable to attacks of nocturnal dyspnœa, apparently from temporary failure of the respiratory centre in the medulla. The patient wakes up with dyspnœa, or rather exaggerated breathing, by which the excess of carbonic acid in the blood is got rid of ; after which the patient usually lies down again, and quickly goes off to sleep. Such attacks are differentiated from those of cardiac dyspnœa by their duration being less persistent. Strychnia gives great relief in such cases of nocturnal dyspnœa in old subjects of lithiasis.

Prophylactic treatment. "Gout is the disease of those who will have it." There is a great deal of truth in this ; but then it is so difficult, and still more so disagreeable, to avoid having it. The anchorite's fare, which is so successful with the robust, is injurious to others, and leads to debility ; a matter ever to be avoided with the gouty. Sydenham avows his disbelief in medicine to prevent gout. He, in this, spoke according to the light of his day, before uric acid solvents were dreamt of. He

wrote—"First, therefore, a Mediocrity is to be observed On Meat and Drink, so that neither more Nourishment be taken in than that the Stomach can concoct, lest the Disease should be heightened by it; nor on the other hand, must the Parts by too much Abstinence be defrauded of that Proportion whereby their Strength and Vigour ought to be sustained, for by doing so they will be more weakened; for either is alike hurtful, as I have frequently found in myself and others." Golden advice this, by the wise old physician. He preferred meat easy of digestion, and thought "the Patient ought to feed upon one sort of Meat at a Meal; for various Kinds of Flesh eaten at once disturb the Stomach." As to a "milk-diet," it was in vogue in his day, and he says "it has done more Good to many than any other Kind of Remedy for this Disease as long as they kept exactly to it." But he insists when such persons relax their dietary the gout returns. As to alcohol, he is the advocate of temperance rather than total abstinence. The effects of the latter in those accustomed to wine have been given in his own words before (p. 149). For aiding digestion in the patient who, either from long use of alcoholic drinks, "or by Reason of old Age, or Weakness, cannot concoct his Meat, without Wine or some other fermented Liquor, he cannot leave it off suddenly, without great Danger, the doing whereof has been fatal to many." "Tranquillity of Mind," also he regards as of great moment. Exercise and the avoidance of indolent habits are most desirable.

Scudamore, amidst some excellent advice, says :—"For persons subject to gout I would, with occasional excep-

tions, disapprove a luncheon of animal food, except under circumstances of great bodily exertion." Nor does he, on the other hand, deem too long fasting desirable. He goes on—"In the summer season, when the palate is tempted by fruit it is admissible either baked or boiled, mixed with baked or boiled rice. The rice very usefully qualifies the action of the fruit. All puddings of the farinaceous kind are wholesome, as rice, sago, bread, &c., and an apple-pudding is proper." I wish the reader to take note of this quotation. On alcohol he is for temperance. For the plethoric and robust he thinks they do well in "adhering to the safe beverage of water;" but he writes—"As a general statement of the question, I would contend that a small portion of wine after dinner is as useful and innocent for a gouty person as any other." Atonic persons require wine, robust individuals should avoid it—are his conclusions. After relating some cases of trials he concludes:—"I must add, also, my entire acquiescence, that a suspension, for a time, of nutritive diet and of the use of wine is capable, in some instances, of affording material benefit to the constitution. Indeed, in some cases of long-established visceral obstruction and vitiated state of the alimentary secretions, both in gouty persons and others, I have found the happiest consequences to follow from the temporary adoption of a diet consisting chiefly of milk, vegetables, and a farinaceous food, in conjunction with a course of medicine; but such a plan has been provisional only, and with reference to existing disease, and is entirely to be distinguished from the regimen of a severe abstinence for life."

Regulation of the bowels he thought of great service, and preferred for occasional use a pill of gamboge, mercury, aloés and soap; which he held acted upon the kidneys as well as the bowels. He says that many of his patients "have pursued a moderate course of corrective and aperient medicines in union with a regulated regimen" with much success; both as to the avoidance of gout and the improvement of their constitutions. Alkalies he thought useful; magnesia being preferred. Scudamore condemns the opinion that aloes is contraindicated in piles, rather holding it beneficial; an opinion shared, quite independently, by Fordyce Barker ("The Puerperal Diseases," p. 33). Of course any purgative may produce piles by excessive action, which is as bad as constipation for the rectal lining membrane.

Garrod holds, a restricted dietary, especially when an attack might be expected, with a dose of salines, very useful. A course of mineral waters attains the same end. Salines he prefers to the employment of colchicum; a view with which I am in entire agreement. Complete abstinence from alcohol often relieves the patient from attacks of gout; but like the authorities just quoted, he does not advocate this for all.

My own views are in full accord with these given here; the use of uric acid solvents being very good, the restricted regimen is often much helped by resort to hepatic stimulants. It may not be possible to avoid all gout; but very much gout is to be classed as "avoidable," i.e., if the patient set about the matter in earnest.

CHAPTER X.

THE TREATMENT OF THE PAROXYSM.

THE full details of the last chapter render the treatment of acute attacks of gout a matter not requiring lengthy elucidation. Like the thunderstorms which clear the air, gouty attacks, though painful, are wholesome. Of course the avoidance of the causes which lead to gout is better in every way than having the paroxysm. But after all, fallen humanity is what it is: and gout is not likely to disappear off the face of the earth by any fulness of acquaintance with its genesis.

When called in to an acute paroxysm of gout, the bulk of practitioners still resort to Scudamore's favourite mixture, viz., sulphate of magnesia, with carbonate of magnesia and colchicum in mint-water; with a mercurial pill at bedtime. In fact, this is the routine treatment of gout with the profession. Nor is it to be condemned; only another treatment is better in my opinion, viz., the free exhibition of potash and lithia, well diluted. Many will add opium in some form, especially if there be no kidney mischief to contraindicate its exhibition.

Nor can it be denied that colchicum does assuage the agonizing pain of acute gout. When uric acid solvents were unknown, and Cullen's dictum of "patience and

flannel" dominated the medical mind, the discovery of the utility of colchicum was indeed acceptable. Scudamore wrote, "Its magic powers of ease were very naturally hailed with delight by the suffering patient; and gout no longer appeared a disease of difficult management, or a source of terror. The sequel, however, has shown the fallacy of the charm, and has served to illustrate the fact, that the best remedies are not those which hastily produce a palliative and transient relief; but, on the contrary, such as are administered upon sound general principles, are carefully adapted to the variations of every particular case and constitution, and are pursued with steadiness and perseverance."

Colchicum, like other drugs, affects different people in different degrees. Some seem to take it freely with advantage; while with others again much nervous depression ensues from resort to it, which may persist for some time. Scudamore holds, "It tends also to render the bowels inactive, to diminish the alimentary secretions, and materially to weaken the functions of the liver. In the general character of the medicine it may with truth be stated that sooner or later, in proportion as it is freely employed, it leads to a broken state of health." If employed, then, let it be with the eyes of both medical man and patient wide open as to possible, indeed probable, consequences.

Wine of white hellebore with laudanum given freely was once in repute; but it is a combination not used now.

The treatment of an acute attack of gout to my mind runs as follows :—

If the patient exhibit a foul tongue, thickly furred, and have vitiated stools, then a mercurial pill at bedtime is indicated; and next morning a full dose of sulphate of soda with bicarbonate of potash or potassio-tartrate of soda, in infusion of gentian, and some carminative in hot water. When the liver is thoroughly unloaded and the tongue clean, then the purely anti-uric acid treatment may be adopted. But if these results are not attained, then it would be well to give some sulphate of soda with potash or lithia three times a day, freely diluted; and to give the mercurial pill again on the third night (not the next) with the morning purgative. Probably if the bowels have been kept loose, the second free purgation will clean the tongue; the visible portion of the alimentary canal. How long this alkaline-laxative treatment with cathartics at intervals has to be pursued, depends upon the case and its indications. A robust plethoric individual being the patient so far under consideration.

Then it might be well, when the stools lose their offensive character, to move on to full doses of potash and lithia, either in infusion of cascarilla, or taken effervescing with lemon-juice, lime-juice cordial, or plain citric acid: to be taken three or four times a day, largely and freely diluted.

In comparatively slight attacks of gout such alkali taken effervescing will often produce great effects in a little time. A dietary of apples, with potash and lithia, taken with citric acid frequently during the day, was the treatment of acute gout in one case known to me, and the attacks quickly yielded. But when there are

evidences of much liver disorder, then mercurials with sulphate of soda are certainly indicated.

In the case of a north country doctor—who has in no wise changed his views about calomel from what they were forty years ago—he takes ten grains of calomel at bedtime. If not freely purged at two in the morning other ten grains; if these have not acted freely at 6 A.M. a third dose of ten grains; or in all half a drachm of calomel. This purges him freely with the greatest relief. He is a hale and robust man, and does not seem to suffer from such heroic treatment. This case is not recited as an example to be copied; but is given to illustrate the fact that calomel is not so fraught with danger, and so utterly to be given up, as has been the fashion recently. There can be no doubt whatever that when the tongue is furred mercurials are indicated; the shade of John Hughes Bennett to the contrary notwithstanding.

Then as to the use of opium. When the pain is intense then opium is certainly indicated. But it must be given freely. Sir Henry Holland said, wisely:—"In procuring sleep (and allaying pain) opium is the most valuable remedy we possess, and *its use is not to be measured timidly by tables of doses, but by the fulfilment of the purpose for which it is given.*" ("On the Use of Opiates.") Scudamore says:—"It is worthy of consideration that so powerfully does pain modify the influence of opium on the nervous system, in every kind of disease, that it may be given in the boldest doses, without hazard or ill effects, when pain is very intense;

and in no other way than by the active repetition of such doses can it be really efficacious, when the occasions for its employment are urgent." Bold, yet cautious, must the practitioner be who would wield opium skilfully. When the pain is great give opium freely; when the pain diminishes lessen therewith the dose of opium. The dose which can be borne, not only with impunity but with every advantage, when the suffering is great, becomes a source of danger when the agony is over. Fuller is quite right in holding that "doses far exceeding in amount the quantity usually administered" neither check secretion nor produce cerebral disturbance when properly given: even when it is not in sufficient dose to compel sleep, "it has calmed the patient's irritability, relieved his sufferings; and has thus prevented the wear and tear of the system arising from a long and painful illness." Where it obviously disagrees with the patient it should be withheld. Small doses are sufficient to elicit this point. But when small doses do not disagree; then the amount of opium may be pushed in strict proportion to the suffering; which it will relieve even when the dose is not large enough to compel sleep. Sleep can only be attained by a still larger dose. Consequently, if the pain be severe, two grains of opium may quite safely be given at bedtime, with from ten to twenty drops of laudanum in each dose of alkaline medicine, or more at times. Though opposed to the resort to opium when the respiration is embarrassed—for opium kills by arrest of the respiration, and then the heart—its free use is at times indicated. It tends to

check the action of the liver, and the output of solids by the kidney; consequently, when any uræmia is threatening, opium will aid its oncome materially. When the tongue puts on that ominous brown fur of uræmia or the typhoid state, then opiates must be withdrawn, and quickly, else the scene is soon closed over. But when the liver is under the powerful stimulus of the measures given above, and the kidneys are excited by the potash, then opium in large doses does not disagree, especially when the pain is severe. The stimulant effect of pain prevents all practical danger of the opium depressing the circulation and respiration to any grave length; but when the pain lulls, then the tolerance of opium goes with it. It is most desirable that the reader fully grasp what is here said about the resort to opium. If too timid in its use, much needless suffering will go on unrelieved; if not familiar with the causes of its risks, doses fit and proper at one time may be continued after the urgency has passed away, and so be fraught with danger to life. To be bold wisely is the moral to be inculcated.

Then as to the dietary. It should be slight in character. In severe attacks the fever causes much thirst. Even when there is no such pyrexial thirst present, fluids are indicated to bathe the tissues and flush the sewers. The patient has little appetite. So milk and seltzer water, whey, rice, apple or tamarind water, are the chief requisites. A little beef tea or chicken broth, with some baked flour; or a roasted apple may be given at times. As the attack passes off, then a little white

meat, as boiled fish, may be allowed. If there be any relapse, or return of acute symptoms the treatment must go back accordingly.

Bleeding is now obsolete for attacks of gout. Emetics may be indicated, especially if a meal of unsuitable food has been indulged in.

Garrod holds that combined with sudorifics and purgatives opium is to be used, and so combined it is free from "baneful influence upon the secreting organs." He says:—"The compound powder of ipecacuanha is a useful form." I have long been under the impression that the explanation of the fact that Dover's powder can often be borne when opium in other forms disagrees, is due to the ipecacuanha combined with it in the preparation.

When the attack is passing away it may be well to give some Dover's powder at night, with potash and lithia in a bitter infusion in the day; and a mercurial and some purgative next morning, according to the indications of the tongue.

When there is present dilatation of the heart, or obvious atony or debility, the measures must be modified accordingly. And here no directions, however minute, would be of any avail. The practitioner must think and judge for himself; no one can do his thinking for him. If he feel unequal to decide single-handed, call in the best head in the neighbourhood, and follow the instructions given. This may be said. Do not attempt to hurry the case, as might be permissible with a patient comparatively young or robust. The patient may

urgently demand measures that once were safe, but which are no longer admissible, and may be wrath at not having his wishes complied with; for gout makes people impatient, irascible, and even uncharitable. Share the responsibility, then, with some one of repute.

In all this last class of cases mind this, my reader. Laxatives rather than purgatives; and always let the laxative be corrected by carminatives, if you wish to stand well with the patient. If the night pill gripes add some extract of hyoscyamus.

Then as to the local measures.

First what to avoid. Leeches. Garrod has seen ankylosis follow the application of leeches to a joint the seat of acute gouty inflammation. Blisters he thinks are to be avoided, except when effusion lingers in a joint. The moxa has had its day. Sores on gouty joints are apt to be intractable and to persist, despite treatment, for long. Cold is fraught with great danger, however comfortable to the suffering patient. The "Kalt Umschlag" is pleasant, but it is unsafe. As to immersion of the red-hot joints in cold water, it is perilous. H. C. Lea in his "Studies in Church History" tells of a Count of Brittany, sore vexed with gout, for which his physician could give him little relief, who "bethought him that if he could lave his feet in one of the sacred vessels of the altar, he could not fail of a cure." But "the malady suddenly increased, and the sick man never again was able to use his feet." This result was attributed to the wrath of Heaven for such desecration of the sacred vessels." And Gregory of Tours tells a like story of a Lombard chief.

What may be done is this, an alkaline lotion containing a large quantity of opium, or some aconite may be applied freely on flannel and a piece of oiled silk be wrapped round the feet. Warmth and moisture are good. Then pencilling the shining joint with nitrate of silver is good. Belladonna suits others. A strong solution of atropine with morphia finds favour with Garrod. Eucalyptus has been tried. Then when the acute stage is over, if effusion remain, say in the knee, it is well to paint iodine on it. Equal quantities of tincture of iodine and nutgalls form a mixture which does not blister, but brings out a rash like that of croton oil liniment. Rubbing is good; and Sir William Temple thought no one need suffer from gout who could afford a slave. Morgagni, in his own case, used warm baths and friction to the feet, which drew out the gout, he thought. Cotton wool is always comfortable; and flannel had the advocacy of Cullen.

Rest is essential; but "pain the protector of the voiceless tissues" secures this in gout. Exercise after the attack is over is good for the stiffened articulation.

Such then is the management of an attack of an acute paroxysm of gout.

As the patient becomes convalescent great care is requisite to prevent a relapse, or the acute gout passing into a chronic state; and Sir Charles Scudamore has two passages so apt and wise on this subject that I cannot refrain from quoting them *in extenso*.

"It occasionally happens, that the returning powers of the stomach demand rather that the patient should exercise a degree of self-restraint, than that his appetite

should be excited by medicine; and careful regimen, both as to diet and exercise, early hours, and some regulation of the bowels may constitute in such case all that is necessary to restore the general health."

Against this let me quote another paragraph.

"A protracted state of chronic gout is almost invariably maintained by an unhealthy condition of the functions of the liver; and when this is the fact, the patient should be rather taught that he is undergoing a probationary course for the cure of this organ, than for the cure of gout alone. With such a truth impressed upon his mind, he will the more readily accommodate his expectations to the periods of weeks or months which may elapse in obtaining his cure. I am clearly convinced that no treatment but that which is truly constitutional can procure solid and lasting benefit. If, also, in the progress of the cure, a relapse of gout do take place, it does not contradict the propriety and value of the plan of treatment; but rather proves the deep seat of the complaint which has been fixed in the constitution; and our conclusions should animate us to persevere in our means of gradually eradicating the evil. I have before remarked, that the most difficult cases of gout are those in which some quackery has been previously employed; and from which a disposition to frequent relapse has been acquired; but I have also observed, that due perseverance on regular principles of proceeding will conquer even this difficulty."

The tendency of acute gout to relapse or to become chronic, cause the words of the great teacher on gout to

come home to us in our own experience. Quackery, which usually means excessive use of colchicum, leaves the system the prey of atonic gout, from which it is indeed difficult to rescue it. Acute gout in the robust is comparatively easily dealt with ; but paroxysms in the old, the weak, and the broken down, or those who have had colchicum to an injurious extent, present greater difficulties.

CHAPTER XI.

RHEUMATIC GOUT.

RHEUMATIC gout, or chronic rheumatic arthritis, as Dr. Adams prefers to term the malady, has also been called arthritis deformans, from the deformity produced by it. It is a disease *sui generis*, of depraved nutrition of the epiphyses of bone; not a blend of gout and rheumatism, or a hybrid, as commonly supposed. It affects the hip and shoulder, and the hands; as commonly seen. Sometimes, and mainly in women, it comes on after an attack of rheumatic fever in a widespread form, rendering the individual perfectly helpless. It differs from gout in its clinical features, and also in its morbid changes.

As to its pathology, Wilks and Moxon describe it as at first an increase of synovial fluid, while the wall of the joint is more or less thick. Then the articular cartilage becomes eroded, and the ends of the bone become softened; or at other times the articulating surfaces become perfectly smooth, as if glazed or enamelled. More commonly the softened bone spreads out, and an "ossifying periostitis" builds a rim of bone around the diseased surfaces. This is especially the case with the hip. In the shoulder "the glenoid cavity is expanded and flattened, but generally has not much new bone around it." In the elbow the same changes are found; in the knee "it is not uncommon to find, besides the usual osteophytes on

the bones, a number of large or small plates of bone in the capsule of the joint, feeling like supernumerary patellæ." The vertebræ are sometimes affected. The hands and fingers are much deformed in many cases. It differs from gout in that the feet escape to a great extent; while gout has a preference for the feet. In rheumatic gout there are no deposits of urate of soda, as occur in gout. "When gouty cartilages are microscopically examined, their cells are found to be surrounded by needles of urate of soda, crowded around the cartilage cells, so as to give them the appearance of mossy birds'-nests." In rheumatic gout the enamelled surface "is confused and almost structureless, so that it is evidently not a new development, but is rather due to mechanical condensations of the old bone." Softening of the bone into a "bony paste" seems the ordinary pathological change. Bony and cartilaginous formations in the larger joints are not uncommon.

The changes in the bones of the hand need not be described here. The appearance is characteristic.

The entire absence of urate of soda, or uric acid, in the blood in rheumatic gout tells that uric acid is not the poison of rheumatic gout; if poison it has any. Of course, patients with rheumatic gout may pass some urates, just as persons without either gout or rheumatic gout may, and do at times. "Sometimes albumen is present, not, however, as a result of the disease in question, but rather of the depressed state of the system so often seen in connection with it." (Garrod.) It is unlike gout in that it has no hereditary tendencies, and is common in women.

As to age, the acute and general forms are common with young women; while the hip-joint is the seat of disease with men in advanced life.

Anything entailing debility acts as an exciting cause. Rapid childbearing may set it up. What rheumatic gout is, is a question which cannot be answered. But it is possible to say what it is *not*. Garrod quotes Fuller to this effect: "The disease should not be regarded as of a hybrid character, or in other words, made up in part of rheumatism, in part of gout." Rheumatic or gouty persons may develop rheumatic gout; but even here the arthritis cannot be regarded as causally related to either. Garrod writes: "It appears to result from a peculiar form of mal-nutrition of the tissues of the joints, being an inflammation accompanied with defective powers; but there is no evidence, upon which any reliance can be placed, to show that it depends either upon the presence of any morbid principle, or upon a weakened condition of the vessels or structures of the affected parts." It is a disease of debility—that may be affirmed. It is free from any tendency to affect the heart, or to induce any kidney change.

Rheumatic gout then is a disease *sui generis*, in which there is general atony and a depraved nutrition of the ends of bones, of the epiphyses indeed, to speak broadly. Yet there is no dyspepsia, except as an incidental matter. Fuller, who gives great attention to it, says: "Its earliest attacks are usually seen in girls whose uterine functions are suspended or ill-performed:" while "it invades the stiffening articulations of the woman who has arrived at

that time of life which is marked by the cessation of the monthly periods; it shows itself during the state of debility which follows a miscarriage, or a difficult and protracted labour, more especially when the labour has been accompanied by flooding. It occurs in the children of consumptive parents, as well as of the gouty and rheumatic. It follows severe depression from nervous strain, or excessive venery." These causes point significantly to the line of treatment to be pursued when the disease shows itself.

It may occur in an acute form, Fuller thinks, resembling acute rheumatism, except that the small joints are more affected than in rheumatic fever. He would prefer to say that chronic rheumatic gout is not the result of rheumatic fever, so much as of an acute arthritic attack, diagnosed as acute rheumatism, which it closely simulates. It is a bilateral disease when general, the symmetry of the two sides being remarkable. As a disease of the hip-joint it is, however, unilateral as a rule; with exceptions.

Often a good deal of deformity is produced before much suffering is complained of: but pain follows in time. As regards the hip, the head of the thigh bone is flattened, and "this, together with absorption of the cartilages, leads to so much shortening of the affected limb, and renders rotation of the thigh so difficult, that the patient walks lame, and presents an exceedingly awkward appearance. The nates of the affected side become flattened, and the muscles of the thigh, in some measure, atrophied from want of use: the foot is everted, and sometimes the toes only can be placed on the ground;

whilst from the difficulty or impossibility of rotating the leg, circumduction of the limb is rendered necessary."

When the knee is affected "there is little, if any, effusion into the surrounding tissues, the synovial membrane, full and distended, may be seen projecting at those parts where the adjacent structures offer least resistance, and if the two hands be placed one on either side of the joint, fluctuations may be made perceptible to the touch."

When the disease is advancing, the rims of osseous growth tell unmistakably of the nature of the malady, at whatever joint it exhibits itself, except the hip. There may be no disturbance of the general health, and the patient may be florid, "and the only noticeable indications of declining health are fretfulness or irritability of temper, with depression of spirits, coldness of the extremities, feebleness of the pulse, and pale or almost colourless urine, remarkable for the extreme lowness of its gravity."

At other times there may be evidences of indigestion, or a disturbed liver. The actual joint changes "appear to depend upon a process allied to slow perversion of nutrition, rather than to an ordinary active inflammation."

(Fuller.) Its diagnosis, however, is made by the eye as it learns to recognize the disease; and it is not easy to put on paper the data which go to form the diagnosis.

Haygarth's sketch of the points which distinguish it from gout is as follows:—"The nodes appear most nearly to resemble gout; both of them are attended with pain and swelling of the joints, but they differ essentially in many distinguishable circumstances. In gout the skin and other integuments are generally inflamed, with pain

which is very acute, soreness to the touch, redness and swelling of the soft parts, but in no respect like the hardness of bone. The gout attacks the patient in paroxysms of a few days, weeks, or months, and has complete intermissions, at first for years, but afterwards for shorter periods. The gout attacks men more frequently than women. There is one distressful circumstance which distinguishes this disorder; it has no intermission, and but slight remissions; for during the remainder of the patient's life the nodes gradually enlarge impeding more and more the motion of the limb: the malady spreads to other joints without leaving or producing any alleviation in those which had been previously attacked."

It is of importance to recognize the malady as soon as possible in order to remedy it.

Alkalies and colchicum do no good. Salicylic acid does not affect rheumatic gout as it does rheumatism proper. The change is not inflammatory; and therefore must not be met by the measures suited to inflammatory changes. "Nothing in my experience," says Fuller, "so greatly tends to endanger recovery, nothing assists so much in perpetuating the rheumatic state, as over-active or depressing treatment."

In a case sent to me last spring from the Durham coast, the patient was a lady of good physique, but who had had a number of children rapidly. Alkalies and colchicum had been tried: also salicine, without good result. The liver was attended to and some arsenic prescribed, while she was sent to Ventnor. She improved

rapidly, and when the assimilative organs were put right, some cod-liver oil and iron completed the cure.

In approaching rheumatic gout the general condition of the patient has to be carefully estimated; if there is anything to be put right, let it be attended to at once. Clear the case, indeed, of any co-existing trouble, after which the rheumatic gout can be dealt with. If the locality in which the patient resides be undesirable, some other locality is to be selected. The patient must be placed under conditions such as favour the system to cast off the cachexia which is undermining it.

As to local applications, a potash and opium mixture applied warm is the only topical treatment needed in most cases, according to Fuller; with rest, of course. Where there is much vascular fulness then leeches or blisters, or both, may be indicated. Splints to the joints are good when the active mischief has subsided; and iodine may be applied to the skin. Baths, rendered alkaline by carbonate of soda and potash, have been found very useful. Bark and tonics, with alkalies where indicated, constitute the plan of general treatment. When the appetite fails and there is much depression, strychnine with an acid is to be preferred. Mercurials are too depressing in his experience, and other hepatic stimulants are to be employed. Arsenic may be added in the intractable cases with inactive skin. Arnica, too, he thought highly of. The daily use of the bath with friction he advised.

Surgical treatment of the affected limb may be required.

The diet should be simple yet nutritious. Some

generous wine, or sound malt liquor may be taken with advantage. The clothing should be light but warm.

Then Garrod disapproves of the Turkish bath, which he has seen do harm. The stronger alkaline waters are to be avoided as being too debilitating. The local vapour bath to the joint is good; or the limb may be covered with hot sand.

The treatment of rheumatic gout is a matter involving no little knowledge; and is not always highly successful, even when the requisite knowledge is forthcoming, much depending upon the patient's constitution.

Then as to watering-places, Fuller says, "It might be supposed that the importation of the various waters would render a visit to their source unnecessary. But such is not the case. The natural waters may be taken regularly at home, and diligent use may be made of baths containing the same constituents in solution, but the effect is far different from that observed during a residence at the springs. The vast importance of the total change of scene, air, and habits consequent on a visit to the English or Continental watering-places can hardly be over-estimated; a new stimulus is imparted to the system; the organic functions receive an impulse which cannot be communicated to them in any other way; and remedies which have proved unavailing at home very shortly become active agents for good. Indeed, it is a question whether the benefit derived from a visit to any of the thermal springs is not attributable almost as much to this sort of influence, as to the medicinal action of the waters."

Good and wise measures, followed out with patience and perseverance, have done much in cases which seemed to have little promise in them, to judge from the recorded cases of various writers. Garrod's experience has been as follows: "Some time ago I was inclined to take a very desponding view of the amenability of this disease to treatment; but, year by year, I have become more hopeful, and I have frequently seen patients who, I feel sure, if they had submitted themselves perseveringly to a rational course of steady restorative treatment, instead of being led by the solicitations of injudicious friends and empiricising advisers to give themselves up to every form of quackery, would have been restored to health, instead of becoming, as many of them unfortunately do, miserable and incurable cripples."

This vigorous expression of opinion by so competent an authority ought to carry great weight with it, and encourage all to persevere in the treatment of rheumatic gout; bearing in mind always its pathology as a disease of depraved nutrition of the epiphyses, and not a hybrid betwixt gout and rheumatism, to be met by a shifting treatment—leaning now to gout and then to rheumatism—but a disease *per se* with its own requirements.

CHAPTER XII.

CHRONIC RHEUMATISM.

Of the pathology of chronic rheumatism we know nothing; but clinically it is well known, and has distinct features of its own. It has a relationship to gout—that is pretty certain; and a great deal of gout is called rheumatism, as being a less offensive term to many ears. Many patients will admit they have rheumatism quite readily, who would transfer their professional confidence elsewhere, were the medical man to adhere tenaciously to, or sometimes even to hint, the term “gout.” Whatever the poison—if poison there be—whether uric acid or lactic acid, as has been conjectured, or some other acid, yet undiscovered—the impression is general, that rheumatism is “something in the blood.” The relations of acute rheumatism to lactic acid have been placed beyond cavil by the fact that large doses of lactic acid given in cases of diabetes have been followed by rheumatic fever, in a manner that removes the relation from mere coincidence, and relegates them rather to cause and effect (Balthazar Foster, and others).

Chronic rheumatism may show itself in (1) joints; (2) muscles; (3) sheaths of nerves; and (4) in the heart. Da Costa's definition was as follows:—“The affection may show itself in the joints, giving rise to stiffness, dull aching pain produced by motion, but with-

out heat or very obvious swelling, tenderness or febrile excitement, or marked sweating; or it may implicate the muscles in various parts of the body, occasioning stiffness as well as pain when they are moved; or it may attack both joints and muscles; or it may be seated chiefly in the sheaths of nerves, leading to what is called neuralgic rheumatism, of which, for instance, sciatica often affords a striking example. In any case the occurrence of the pain furnishes the starting-point in diagnosis, and we must ascertain, by careful examination, whether it be augmented by motion, whether it be more or less shifting, whether it be not combined with stiffness either of the muscles or of the joints, whether it be influenced by changes of temperature, whether it be not neuralgic, or associated with a disturbance of some viscus, such as the liver or kidneys—before we conclude that the complaint is really rheumatic.”

As regards the last, there is the well-known “shoulder-tip pain” (right side) of liver disorder; the “spots of pain” at the inner and lower edge of the scapulæ, found with excess of excrementitious matter of nitrogenized nature in the blood; the pain in the loins, or shooting down the genito-crural nerve into the groin, the thigh and the testicles, of trouble in the ureter; the pain in the loins in women, of ovarian origin; or passing to the crest of the ilium, or into the sacrum, usually uterine. A load in the bowels may cause sciatic pain, or lumbago. Indigestion may cause constant pain betwixt the shoulders. An aneurysm of the descending aorta eroding the spinal column will often be called rheumatic, as there is nothing

to see externally. While syphilitic periostitis is usually called rheumatism, especially if there be little or no thickening. In one case, which came under my notice long years ago, there was persistent pain in the ilio-inguinal nerve on the right side, constant and persistent despite all treatment, which was called rheumatism until symptoms of liver mischief developed themselves; when it was suspected to be due to an abscess of the liver pressing on the trunk of the nerve—a diagnosis verified by post mortem examination. Again, rheumatism may be the diagnosis when there is pus forming in the inter-muscular planes, until fluctuation reveals the real nature of the case. In "*Langenbeck's Archives*," No. IX., is related a case of periostitis and osteo-mylitis of the femur, which was mistaken for rheumatism at first. And this mistake is not very uncommon. Or where the sensory root of a spinal nerve is nipped at the foramen, as occurred in a case recently seen, where there was some syphilitic thickening of the periosteum at the spot where an intercostal nerve emerged from the spinal canal; and which was called rheumatism. The changes in the epiphyses of children when growing rapidly are often productive of pains, which are habitually classed as rheumatic or "growing pains." The pain over the loins found in many women with "weak back," and relieved by rest in the recumbent posture is often misnamed rheumatic. So are the pains in the interossei muscles of washerwomen's hands, also muscular, called rheumatism, when really they are "myalgic." The pains of spinal conditions, as locomotor ataxy, are constantly deemed

rheumatic pains till time clears the diagnosis. It is well then to follow Da Costa's advice and make sure that there is not something else—"before we conclude that the complaint is rheumatic."

The pain of rheumatism is a dull aching pain, aggravated by movement. It is quite different from that of gout, as any gouty person, who has slept with the shoulder uncovered and "got rheumatism in it," well knows. The subjective impression is quite different. The gouty pain is sharper, less tolerable, and more exasperating. Then there is the pain of chronic osteal or periosteal change, always worse at night and on going to bed; and here the difficulty of early diagnosis is increased by the fact that rheumatic pains with some patients are worse when they get warm in bed. Then there is a condition of chronic pain closely simulating rheumatism, which has been described by Prof. Leudet, as connected with chronic alcoholism. And Mr. Higginbotham, of Nottingham, has given the name of "alcoholic rheumatism" to a condition linked with alcoholic excess, and curable only by abstinence; of which I have seen at least one well-marked instance, which occurred when in general practice in Westmoreland.

It is obvious to the reader that the matter of sub-acute rheumatism, or of chronic rheumatism following upon acute attacks, does not fall within the scope of the present treatise. In so far as rheumatism of chronic character, related to chronic gout, indeed, in some cases, more fitly termed "the rheumatic forms of gout," is concerned, it may properly be considered here. For instance

that drawing down of a finger on the palm, which Sir James Paget describes as gout—and in this view most will agree with him—is described by Sir Charles Scudamore as chronic rheumatism.

Now rheumatism has no morbid anatomy which can be regarded as peculiarly its own. Bursal changes, synovial changes, changes in the ligaments of joints, or in the periosteum are found with chronic rheumatism doubtless. Monro held that the muscles are frequently inflamed, and this inflammation does not go on to supuration, but rather to rigidity and weakness, with effusion into the sheath of tendons, or into bursæ. And Wilks and Moxon give no account of chronic rheumatism as distinct from "chronic rheumatic arthritis," (rheumatic gout), and "gouty arthritis." Indeed, the changes given by older writers under the heading of chronic rheumatism, are classed under these two heads by more recent authorities. Then rheumatism may settle down upon the seat of an injury as a severe sprain or bruise; or in parts subject to much strain habitually, like the labourer's hands; or in parts that are much exposed to cold, and especially when the two are combined. The bowed spine of labourers, as field hands and bargemen, is attributed to rheumatism; but how far there is absorption of the intervertebral cartilages as a factor, or an osteophytic growth under the periosteum binding the vertebræ together (analogous to the jack-spavin in the horse), are matters which cannot be discussed here. Haygarth thought chronic rheumatism was to be distinguished from maladies simulating it by the absence of swelling. Whether there

is any periosteal thickening essentially belonging to rheumatism may be questioned. That periosteal thickening is often called rheumatism is certain. Osteophytic growths may occur with rheumatism; but it cannot be said that such growths are an essential to rheumatism, for they are rare, while rheumatism is common.

The rheumatic frequently have prominent joints; but this is often due to wasting of the muscles, by which the articulations are thrown into strong relief; such pseudo-enlargement of the joints must be distinguished from true actual nodosity.

Admitting, as we must, that chronic rheumatism has no pathology nor morbid change strictly its own, we know it well enough as a congeries of symptoms. There may be bursal fulness connected with it; or there may be synovial changes or effusions; or there may be periosteal thickening; but these are not requisite for the diagnosis of rheumatism as we know it clinically. Nor does our treatment depend upon any complications; though it should undoubtedly embrace the complications in deciding upon what measures to adopt.

In the first place, whenever there is a foul or coated tongue, with a depraved state of the stools, it is well to attend to the liver. A mercurial pill at night twice or thrice a week, followed by a seidlitz powder, or a dose of mineral water next morning, will soon clean the tongue and correct the *primæ viæ*. After this has been done, then the rheumatism may be more strictly attended to. But if this necessary beginning be forgotten, or neglected, many cases do not improve as they ought to do; while if

properly attended to many begin to improve forthwith. At the same time some alkali, with iodide of potassium, may be given in infusion of buchu, serpentaria or sarsaparilla. In other cases the chloride of ammonium is to be preferred. Others would give guaiac, or may be arsenic. What are the rules for administering these agents? the youthful reader asks. Well, the rules are rules of thumb; and all practitioners are not agreed about them! It is always said that guaiac is indicated in the cold forms of rheumatism; that is, where the surface and extremities are cold, and the pain is relieved by warmth. Iodide of potassium is clearly indicated when there is any suspicion of either syphilis or gout being present. Iodide of potassium in infusion of sarsaparilla is often most useful in other cases. (The successful sale of a famous Blood Mixture, which consists, it is said, of these two ingredients, tells of its utility to many.) Then again, where there is much acidity and a sediment of acid or urates in the urine, it is well to give the carbonate of potash with the iodide. Indeed, in many cases such combination in a mixture in buchu or serpentaria or guaiac is very useful.

Such a line is certainly indicated when there is any gout linked with the rheumatism, a not uncommon state. Or, when there has been any sub-acute rheumatism. Then the hydrochlorate of ammonium seems indicated in the rheumatic pains of young subjects; and may be given with guaiac. When there is hemicrania, then the solution of the bichloride of mercury, with or without the muriate of iron, often is most serviceable.

In wry neck it has been said that a combination of quinine and colchicum is the best mixture to select. But what the relations of colchicum to rheumatism are has not yet been settled; at least in any way approaching to its relations to gout: as colchicum relieves gout, probably when the rheumatism is gouty in its nature, then colchicum will give relief. The position of a salicylic acid, or salicylate of soda in the treatment of rheumatism, is in an equally undesirable and unsettled state.

When the rheumatism is clearly due to exposure to cold then diaphoretics are clearly indicated. If the tongue be foul then the old-fashioned four grains of calomel with an equal quantity of James's powder and a grain of opium to be given at bedtime, with a seidlitz power, or its equivalent, next morning, might be prescribed. Most practitioners now-a-days, would prefer to give ten grains of Dover's powder at night instead of the powder just described; but either would be good practice. Then for a day mixture, either chloride of ammonia in guaiac if the urine were quite clear; or if urates were present, then some iodide of potassium with bicarbonate of potash in buchu or serpentaria should be prescribed. If the patient would keep his bed and drink freely of warm fluids, as whey, scalded milk, or apple or tamarind water, so as to keep the skin bathed in perspiration, probably the pain and stiffness would soon be greatly relieved.

When the rheumatic pains, so called, are the "growing pains" of the vascular epiphyses of childhood, then rest in bed is essential. The medicines here to be given are

tonics, vegetable or chalybeate. When the "growing fit" is over, and the child is once more getting about, then a chalybeate tonic certainly is indicated.

The precise measures to be used must be determined by the exigencies of each case. In one instance it may be perfectly clear that potash, with some iodide of potassium, should be given; in another, Easton's or Fellows' Syrups, with cod-liver oil and good food, rather are to be preferred.

Then as to local measures, once more in favour than at the present time. This is well seen in the matter of plasters. Few of our junior practitioners ever prescribe a plaster, unless it be a belladonna plaster, over the heart; yet the belief of patients in plasters is unabated. A good large plaster ten inches by eight over the loins is a comfortable thing in lumbago of rheumatic character; as well as when the pain is due to debility of myalgic nature, known as "backache." (Perhaps something lies in the making of a plaster. A good old-fashioned one, spread carefully by hand, was a different thing from the present machine-made plaster.) Flannel, too, has a great reputation in the treatment of rheumatic pains. A piece of flannel sewn into the ordinary garment over the seat of pain is in high favour with the agricultural poor. It keeps the part warm, and that is something. Then there is the matter of rubbing the affected muscles and joints. Rubbing and kneading are very comforting in muscular rheumatism especially. Then there is the matter of liniments, also a little antiquated, but not to be despised. Hartshorn liniment, turpentine, camphor, belladonna, belladonna

and chloroform, or soap liniment, are all useful in the cold rheumatism of a limb, caused by exposure to wet and cold. But the proper internal medication must go with it. Opium may be added to the liniment with advantage when the pain is severe; as in the *linimentum opii* of the British Pharmacopœia, which consists of equal parts of laudanum and soap liniment. At other times it is well to surround the painful joint with a strip of flannel soaked in this opium liniment, and then to wrap all up in a warm dry flannel. At other times, it might be well to use an ointment of opium and aconite, and then cover up with flannel. When there is a gouty taint, then potash and opium in solution applied hot on flannel are grateful; dry flannel being placed outside. Then the patient should be careful against any exposure when beginning to improve. Rheumatism is exceedingly apt to relapse, or to recur, on any provocation.

The clothing of the rheumatic should be warm. Merino vests and drawers, from neck to wrist and ankle, are indispensable to comfort. Even stouter materials, as Welsh flannel or "fleecy hosiery," may be indicated. The matter of clothing is most important when locomotion is impaired; here the patient must either take passive exercise, as in a carriage, where the heat-loss is not met by heat-production; or "cannot keep himself warm afoot," that is, cannot get a sufficient increase of heat-production when out of doors in cold, or even cool weather, to meet the heat-loss, and so must be warmly clad. But the garments must be light as well as warm, for heavy garments would be insupportable. So let the

patient have a jersey, or a padded waistcoat (all the better if made with seal skin in front) at least. These will protect him from chill when going out. If a fur-lined coat could be added, then a rheumatic patient might crawl along the high road at Malvern and look over the plain of Worcestershire, or the broken ground of Hereford, even on a winter's day, without much discomfort. Or could stroll along the terraces of Ventnor, or the Undercliff, without fear of suffering from the exposure. Clad in this manner, Buxton and Matlock might be visited in spring and autumn, as well as in the midst of summer, with advantage.

One matter there is, too, of soil. Clay is not suited for rheumatic persons. Gravel is much better. Experience tells this unmistakably. I well remember one case of rheumatism in a lady of robust physique, who suffered keenly from rheumatism of the sclerotic. Her medical adviser, a shrewd keen-witted old practitioner, insisted upon the family removing from their residence upon a clay soil away to gravel. The inconvenience was great, and the good not very clear to any one but the old doctor. However, the patient grew so bad, the step was taken, and with the best possible results.

This was a lesson to me by which I have profited; and perhaps it may be useful to the reader. Whenever it is clear that the rheumatic patient is residing on an unsuitable soil, or in a damp locality, it is imperative that the residence be changed. In one case a lady lived up the Rhonda Valley, who was beginning to suffer severely from rheumatism. She was directed to reside elsewhere,

and went to the coast of Glamorganshire, where the rheumatism left her; though she had distinct attacks of gout at intervals.

Waters, too, often do good. Rheumatic patients with gouty affinities usually do well at Buxton, in my experience. Bath waters held a high position for centuries. In the Roman days Bath was famous; but its modern celebrity dates from the time when Princess (afterwards Queen) Anne took her husband there. Bath is a winter resort; and so is the more modern Cheltenham, where King George III. and his frugal spouse stayed some time. The Radnorshire wells are coming into fashion, as the various waters are within easy reach of each other. Harrogate, Moffat, Gilsland, and Shap-Wells are all in repute for rheumatic patients. Sulphur waters seem specially useful where there is any disturbance of biliary character; alkaline saline waters where the gouty factor is distinct. But the good does not lie solely in the waters. Undoubtedly the water, as water, when copiously drunk is useful, the matters with which the water is charged are of service; but the locality, the change of habits, the attention devoted to health, which at home is apt to be overlooked—all combined, do rheumatic patients much good.

When motion is limited in a joint, say the shoulder-joint for instance, adhesions are apt to form; which further limit the power of motion. Here it becomes absolutely necessary to break down these adhesions by considerable force, moving the limb in all directions, grasping the muscles firmly at the same time. This plan is not agree-

able to the operator, and is really hard work; while it is exceedingly painful to the patient. Some time ago the writer gave great relief by this means to the superintendent of one of our largest sick asylums. He bore it bravely; but on attempting to carry it into practice among his rheumatic inmates, they fled from the asylum sooner than endure it.

Passive motion, rubbing, massage, and the use of electricity are all good; either when adhesions have formed, or the muscles are wasted. Perseverance with such measures, combined with appropriate medicines and regimen, will do great good in many cases, where the motility is seriously impaired. If there be obvious gross osteal changes involving distinct ankylosis, then, of course, it is useless to expect to restore the motion of the joint. Each case must be treated with common sense, as well as by the appropriate restorative, or palliative measures.

Some forms of chronic rheumatism presenting well recognized features may now be considered. The first of these is lumbago.

Lumbago is a malady of stalwart adults, as a rule. It may be brought on by exposure to wet or cold, or both. Its onset is commonly sudden, and so fell is its grip in some cases, that the patient is pinned to his place; the agony of any movement being intolerable. To get up or sit down, is equally painful. This acute pain may persist for some time, and then subside into a less severe form. In milder cases there may be little or no constitutional disturbance; but in severe cases there is more or less pyrexia, with disturbance of the bowels, usually constipation, a

coated tongue, and a dense urine, not unfrequently laden with lithates of deep colour. If there be any periosteal tenderness of the spinous processes, pressure upon them aggravates the suffering. Whether the malady be one of the muscles solely, or of them and their aponeuroses and their attachments, has not been determined. Lumbago is distinguished from neuralgia by its having no special relation to any nerve; and the absence of tender spots which are usually found along the trunk of the nerve in neuralgia. A calculus in the kidney produces pain in the loins, mostly one-sided, but it has usually the features of nephritic colic (p. 119), with reflex vomiting; while the pain is not so distinctly affected by movement as is the case with lumbago. Lumbar abscess gives local bulging, fluctuation, and a "pus-temperature," is slow of formation and one-sided. Venous fulness in the bodies of the vertebræ will produce bilateral pain; and so may a load in the bowels. (Some years ago croton oil internally was fashionable for the treatment of lumbago. In the two last-named states the potent cathartic was very useful; while in true rheumatic lumbago it is always well to clear the bowels out thoroughly.) The pain of lumbago is closely simulated by "backache," a form of myalgia; and by the pain set up by ovarian, or uterine disturbance. But only a careless observer would confound such conditions with rheumatic lumbago. The "weak back" set up by sprains or injuries closely resembles lumbago; only the condition is more chronic. The acute pain in the back, which is one of the prodromata of small pox, might easily be thought to be lumbago; nor need the author of

such a mistake be much chagrined thereat. Or the condition of myalgia may follow scarlet fever. Despite these simulating conditions the diagnosis of lumbago usually presents no difficulties.

When severe, lumbago usually has accompaniments of liver-disturbance. A mercurial at bedtime, as a blue-pill, or some calomel and James's powder, followed by a black draught, or a full dose of mineral water, or of sulphate of soda and Rochelle salts, perhaps the best form of all, will form a good line of practice. This may be followed up by smaller doses of sulphate of soda, with bicarbonate of potash, in buchu or an aromatic bitter, or camphor mixture three times a day; so as to keep the bowels freely open. It is very desirable to avoid exposure of the loins while attending to the calls of the bowels; a matter of no little moment in country-houses with chilling cloacæ. Dover's powder each night at bedtime will often be of service: or a grain, or may be two, of opium with from three to five grains of Pulv. Aloe. Co., may be at times preferable.

The loins should be covered with flannel; in some cases a linseed poultice dusted over with mustard, night and morning, may be applied with advantage. The dietary should be light, as whey, milk and seltzer water, some stewed fruit with the acidity neutralised by potash instead of being masked by sugar, or a little weak meat broth, for a day or two. Some milk-pudding and white fish might be permissible as soon as the acute condition is passed. As to alcohol it is not indicated, unless the individual crave for it, when a little

weak punch, drank hot, may help to maintain the diaphoresis. If the skin be not freely moist, then diaphoretics are clearly indicated. A full quantity of fluid is as desirable for diaphoresis as for diuresis.

Care in the convalescence is very necessary; and a cummerbund should be worn for some time after.

Intercostal rheumatism is a painful affection. It may be mistaken for the intercostal neuralgia of women, which, however, has its three tender spots: one under the heart, about the apex of the heart; a second at the outer edge of the left scapula; and the third where the sensory root passes into the spinal canal. Intercostal rheumatism lacks these tender spots, but is aggravated by movement.

The pain may be so acute and so aggravated by the inspiratory act as to suggest pleurisy. But the fever and the physical signs of pleurisy are wanting in "pleurodynia." Opiates with acetate of ammonia internally; rest to the parts by a large plaster over the whole of that side of the thorax, or tight bandages, so as to cause the breathing to be almost entirely abdominal, give ready relief. A blister will rarely be indicated; but an opium plaster is often of service.

"Wry neck" or torticollis is often due to exposure. It is due to spasm of the sterno-cleido mastoid muscle of one side, and may be due to nervous causes, as well as to rheumatic. Hypodermic injections of atropia are highly recommended to relax the spasm. The internal treatment of each case must depend upon the features of it.

Rheumatism of the scalp is often confounded with

periosteal nodes. When the nodes can be distinguished, then the case resolves itself into syphilis; and mercury and iodide of potassium will soon give relief. But in cases where the seat of pain is that of an injury, such treatment might not only be inoperative, but actually harmful. The scalp may be very tender, in which this affection differs from hemicrania, or megrim; where strong pressure does not aggravate the suffering, it may indeed, somewhat relieve it, though the hair is often sensitive. Hemicrania is usually one-sided, and occurs in neuralgic gusts; while rheumatism of the scalp is commonly bilateral, and is a steady dull persisting pain, aggravated by movement of the scalp muscles, but relieved by warmth. If there be evidences of visceral disturbance then the treatment must be guided accordingly. As to the head, local applications beyond warmth are scarcely practicable. Sometimes some bichloride of mercury in infusion of bark, or with the muriate of iron, does good, even where there is no suspicion of syphilis; a line of treatment time-honoured, if not in fashion now.

Sciatica is one of the most important forms of rheumatism. It consists, symptomatically, of pain shooting down the trunk of the sciatic nerve, sometimes even to the foot. In some cases, the pain is great in the ham, or extends over the front of the foot. It is commonly rheumatic in its nature, and produced from exposure. At other times, it is rather a true neuralgia; or may be due to pressure of a large womb, gravid or the seat of disease; accumulation of fæces in the colon; or some growth within the pelvis. It may occur in women as

the result of ovarian trouble; but it is then confined to the upper portion of the nerve. Even when sciatica is rheumatic, it still preserves the character of a nerve-pain in its gusts of severity, with intervals of comparative ease.

The pain is always increased by pressure and by any exposure to damp or cold. Like other painful affections of rheumatic character, it may be produced from severe exertion originally.

Another matter connected with sciatica also indicating its neuralgic features is the pressure on tender spots. Da Costa says:—"Pressure on localised spots always develops pain, and the points which are most marked are on the lower end of the sacrum, on the side of the trochanter opposite the emergence of the great and small sciatic nerves, various points on the posterior aspect of the thigh, one at the head of the fibula, and one behind the outer ankle."* When sciatica has been established some time the limb may waste from want of exercise; or there may be evidences of effusion within the sheath of the nerve. The evidence of this is furnished by diminution of the pain, which in some cases is so severe that "the limb actually quivers with pain, and the muscles are drawn into knots by cramp, and thus afflicted and unable to move, the unhappy patient lies moaning during the day, and dreading the approach of night, when the violence of the symptoms, is, if possible, increased." The extreme violence of the pain,

* Parts of this and following quotations have been given before, as illustrations of gouty neuralgia (p. 85), but it seems better to repeat them here than refer the reader back to them.

the cramps and startings of the limb, give way to a new grouping of symptoms, according to Fuller, who says : —“ If thickening or effusion be present, there is then not only local pain, but numbness and partial paralysis of the limb as the natural and characteristic results of pressure on the nerve. The nerve being compressed, its function is impaired, and the symptoms alluded to necessarily ensue. Hence, when a patient who is suffering from sciatica complains of *a dull aching, and benumbing pain in the limb, causing it to feel swollen*; when this sense of numbness and increased bulk has succeeded to pain of greater intensity, accompanied by cramps and startings of the limb; and when, more especially, in addition to these symptoms, there is more or less inability to move the limb—inability arising from loss of power, and not as a result of excessive pain—pressure on the nerve may be inferred.”

Sciatica may be simulated by hip-joint disease; but this latter is always aggravated by the weight of the body being thrown on the affected limb, a semeion from which sciatica is free; or by nephritic irritation; but in the latter the pain is in the genito-crural nerve as well: there is retraction of the testicle with pain in the glans penis. As the diagnosis of one form of sciatica from another, Fuller is so explicit, that it is best to quote him verbatim:—“ If the patient is thin, pale, sallow, and extremely sensitive to atmospheric vicissitudes; if he has experienced pain, or threatenings of pain, in other parts of the body; if at some former period he has suffered from rheumatism affecting the joints; and,

above all, if his present attack is the result of exposure to cold and damp, the disease under which he is labouring is rheumatic, and is to be relieved by vapour-baths, guaiacum, alkalies, and similar remedies. On the other hand, is he stout, florid, and a free liver, taking little exercise, sleeping much; is he plagued with heart-burn, acid eructations, and occasional lowness of spirits, or has he previously suffered from gout, his malady is of gouty origin; and is to be cured by colchicum, alkalies, and alteratives. Again, is he cachectic, and out of health; has his throat been ulcerated, or his skin disfigured by blotches or eruptions; has he taken mercury or experienced pains in his bones, the mischief is probably due to a syphilitic taint, and is to be cured by sarsaparilla with iodide of potassium. Or again, is he robust, and usually in the enjoyment of excellent health; has his present attack been preceded by constipation or irregularity of the bowels, by flatulence, distension, and crampy pains in the abdomen; and above all is it accompanied by coating of the tongue and foetor of the breath; then, if the disease does not acknowledge either of the origins before alluded to, it is probably due to irritation of the sacral plexus of nerves consequent on an unhealthy loading of the intestines. This opinion will be confirmed if the pain be confined to the right leg, for the disease not unfrequently arises from unhealthy accumulations of faecal matter in the caput coli. Such a case as this is to be cured by the administration of active purgatives, both in the form of enemata and by the mouth, together with such other

medicines as are calculated to carry off the irritating matter, and to produce a more healthy secretion from the bowels. On several occasions I have known patients cured by the administration, on three successive nights, of two grains of calomel, two of extract of aloes, and six of scammony, followed on the morning of the fourth day by an enema containing an ounce of castor oil, and an ounce of spirits of turpentine, or two drachms of assa-fœtida, or an equal quantity of confection of rue. In many of these cases, the action of croton oil, as recommended by Mr. Hancock, is often of the greatest service. Again, if the patient has never experienced an attack of gout or rheumatism, and has not suffered from wandering pain in the limb; if he is free from venereal taint, and has not been subjected to a course of mercury; if his bowels have been acting regularly, and the dejections are of a healthy character; if his skin is healthy, his tongue clean, his urine clear, the pulse normal, and the appetite and digestion good; if, in short there is an absence of those symptoms which indicate either of the forms of derangement hitherto alluded to, his malady is probably of neuralgic origin, and is to be relieved by tonics, sedatives, and other remedies directed against that variety of derangement. On this point our diagnosis will be greatly strengthened if the urine, when examined under the microscope, is found to be loaded with the octahedral crystals of oxalate of lime." This is a type of what medical writing should be, clear and rational, showing how accurate diagnosis leads to successful treatment.

In ordinary sciatica of rheumatic character it is well, if the tongue be loaded, to start with a mercurial at bedtime—especially if the patient be robust—with an alkaline saline purgative next morning; and if the bowels be not thoroughly unloaded thereby, and the tongue clean, to repeat the measure the second day thereafter. Then some iodide of potassium with bicarbonate of potass in solution with guaiacum, or serpentaria, or buchu, three times a day, may be given. When the tongue is clean ten grains of Dover's powder every night at bedtime will probably give the patient a fair night's rest. If the progress is slow then some arsenic may be added. When there has been effusion into the nerve-sheath, then it is well to use strychnia after the effusion has been removed by iodide of potassium, and only functional impairment of the conducting power of the nerve-fibrils remains. The effects of the remedial agents may be increased by hot-air, vapour, or even hot-water baths.

The local measures to be adopted are of three kinds—a blister, an hypodermic injection, and sedatives applied along the track of the nerves. The blister is little likely to find favour nowadays. Yet it was a potent measure in the opinions of older authorities. A long strap of blister along the nerve-track, with a little opium, or, better, morphia, dusted along the vesicated surface from time to time, has been strongly recommended; and is worth trial if the pain be very excruciating.

Then there is the hypodermic injection of morphia, a splendid means of affording swift relief from the

torturing pain; but, in my experience, unsatisfactory as regards the ultimate progress of the case. Consequently it must be resorted to only with due consideration, and used along with truly curative measures.

Sedative applications, as opium liniment, or aconite liniment, may be rubbed in, or kept more continuously applied, or both. But the best plan is to make a mixture of aconitia, powdered opium, and glycerine, or even common treacle,; to spread this thickly along a strip of lint, apply the strip along the track of the nerve; cover with a piece of oil-silk, overlapping the lint; and then secure all in place by a turn of a bandage, or the leg of a stocking, from which the foot has been removed. This should be kept on continuously, a reapplication of the compound to the lint being made twice a day. Nor is it well for æsthetic reasons to use a fresh piece of lint always, but rather to retain the old piece as long as possible, as it is saturated with the sedative. Such measure has served me well.

The late Dr. Fuller found a piece of flannel, well dusted and wrapped round the limb, to give relief when other measures have failed. It was of little service when the skin was dry and imperspirable.

The local application of steam or vapour is serviceable in some cases; as well as the use of the bath generally. In many cases the Turkish bath is decidedly indicated.

The same measures, general and local, are to be employed when other nerves than the sciatic are affected.

As to the question of the utility of horse-radish in confirmed cases, and like empirical measures, they cannot be considered here ; nor even the matter of wearing a piece of sulphur, though it is not impossible the latter may be of some service.

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CHAPTER XIII.

*SOME GENERAL CONSIDERATIONS ON INDIGESTION, BILIOUSNESS, DIABETES, AND GOUT.**

It may now be well to enter into some considerations which are of interest; but which will best stand by themselves, much of them being largely of a speculative nature.

The relations of the digestive organs to the urinary secretion and troubles of the urinary organs, have long been recognized. Thus Sir Charles Scudamore entitled his famous book "Gout, Gravel, and Disorder of the Digestive Organs;" while Prout's treatise "On the Nature and Treatment of Stomach and Urinary Diseases: being an Enquiry into the connection of Diabetes, Calculus, and other Affections of the Kidney and Bladder, with Indigestion," has had a world-wide influence. Long before the modern physiologist had bridged over the gap in the history of nitrogenized food betwixt the alimentary canal and the urinary organs; the clinical physician had noted the relations existing betwixt the two. Then Murchison's essay on "The Functional Derangement of the Liver" told us much as to the origin and formation of uric acid and urates. We are now in a position to take a bird's-eye view of

* Some remarks on albuminuria will be found in this consideration (p. 279).

(1) some relations of primary indigestion in the alimentary canal; (2) of the after history of sugar and albuminoids in the liver; and (3), of the appearance of certain products, as sugar or urates, in the urine.

It is essential to see all this in one field, in order to grasp the relations of products we find in the urine to the disturbances of nutrition, in which they take their origin. There was a phase of clinical observation and research when it was thought that, by minute inspection of the urine, the secret of all mal-assimilation was going to be unravelled. It cannot now be said that these hopes have been fulfilled. That it was a part of the inquiry which must be worked at until its real value was determined, may be readily admitted. In order to prevent any misconception, I repeat here some brief quotations from William Roberts. Of phosphatic deposits, he says:—"There is not the least reason to believe that there is any constitutional state specially characterized by an excessive excretion of phosphates." Of course we all know that they are held to be connected with disease, or disturbance of the nervous system. Then as to urates, he writes:—"The frequent or constant occurrence of a brownish or red urate deposit, without, or with only a feeble degree of pyrexia, is a circumstance to awaken suspicions of some serious organic disease; but the indication is more general than special. Organic disease of the lungs, heart, liver, spleen, or any other part, attended with emaciation and waste of tissues, is usually accompanied with abundant deep-coloured urate deposit. Functional derangements of

the digestive organs are also accompanied by pale urate deposits in the urine."

Now the signification of urate deposits is of the highest interest to us. We certainly do know that they have a deep significance. All know the pink deposit of pyrexia. Then, again, there is the red deposit which Prout and others have found well-marked in organic disease of the liver. Those high-coloured deposits have, then, other relations than the pale urates. J. Henry Bennett has made close observations of the urates in relation to indigestion; and holds that the urate deposit seen in many cases from two to four hours after a meal, tells that "the entire series of nutritive processes are morbidly and inefficiently carried on by digestion, chyliification, assimilation, and disintegration." His views, put briefly, are that these deposits indicate "the existence of imperfectly elaborated chyle in the blood; although it may be the result of deficient vital assimilating or nutritive power." Perhaps it may be necessary to somewhat alter this phraseology to express what appears to myself to be, in all probability, the case. In normal digestion perfectly elaborated products of primary digestion find their way into the portal vein, and are elaborated into the albumen of the liquor sanguinis; or broken up into bile acids, or urea. Then as the processes are deteriorated the fully elaborated products are followed by a certain amount of imperfect products later on in the digestive act; which are probably cast out as urates. When digestion, both primary and secondary, is greatly impaired, then the urine is found full of urates, about the time of the completion of the diges-

tive act. Now the time of the appearance of lithates in the urine corresponds to certain subjective sensations of the patient in a very suggestive manner. In such cases the patient will state something like this:—"At first I feel the better after a meal, but in two or more hours I feel very miserable." The explanation suggested by these objective and subjective phenomena is as follows:—When the first normal products of digestion are entering the blood, the patients feel, as most healthy persons feel, namely, a sense of well-being after a meal, when the blood is rich in nutrient material. But soon the impaired digestive organs pass into the blood a quantity of less perfectly elaborated peptones, and then follow (1) the sense of anything but well-being, viz., depression, wretchedness, &c., as the brain is temporarily poisoned by the mal-products of digestion; and (2), the appearance of urates in profusion in the urine.

The reader keeps well in sight the fact that the views put forward in this chapter are largely of a speculative character; and what is being said must be taken just for what it is worth. Certain it is, we do find in the evidence furnished by the renal secretions something which suggests a connection with impaired assimilation, and with the subjective sensations of the patient. Disturbances of primary digestion are related to local sensations in the stomach and bowels, as pain after food, or flatulence, or both. No local evidences are furnished of secondary indigestion, or disturbance in the function of the liver; the presence of mal-products in the blood is indicated by a sense of misery which tells that the brain-

cells are badly nourished or poisoned, or both. The clinical value of urate deposits is then very considerable.

The reader will probably, at this point, ask the pertinent question—If the minute examination of the deposits in the urine has failed to fulfil the hopes once entertained—and yet there seems strong presumptive evidence that different coloured urates indicate different disturbances—what amount of attention ought properly to be paid to the urine? To this, my answer is a quotation from Dr. Bennett—"The urine may be very easily submitted to an analysis sufficient for all practical purposes. If it shows a strong acid reaction by reddening litmus paper, the probability is that the deposit is principally urates of soda and ammonia, which are generally combined. This becomes a certainty if on heating the deposit over a spirit-lamp in a test tube the urine loses its turbidity and again becomes clear and transparent. If the turbidity were due to phosphatic salts, the deposit would remain turbid, the turbidity disappearing on addition of an acid; and if to pus, an albuminous cloud would form and gradually collect at the bottom of the tube. Were albumen present, its solidification by heat would at once give a dense white albuminous cloud throughout the urine, which would also gradually collect at the bottom of the tube."*

This, if thoughtfully done, will ordinarily give such indications as are to be acquired from examination of

* A drop or two of Fehling's solution, added to the boiling urine, will readily tell of the presence of sugar, on putting the tube to the flame once more.

the urine. More elaborate investigation may be called for in some cases; but we no longer seek in the examination of the urine the genesis of the morbid disturbance. Its varying characters or constituents may tell of improvement, or otherwise, and so be instructive. But the matter must not be overrated; nor yet neglected.

Urates themselves are colourless; but the amount of pigment they carry with them, varies with the different circumstances under which they are formed; hence the significance of their colour. The paler the urate deposit the more urate of soda is present; the deeper coloured, the larger the proportion of urate of ammonia. White deposits of urate of soda are associated with indigestion. Deep urate deposits, with pyrexia, organic disease, or the concentrated urine of venous fulness, as in cardiac failure.

So much for urine-sediments, their origin and significance. When such urates are formed in excess for long periods, the urinary organs are irritated thereby; and structural changes in the kidney follow. Not only are the finer structures of the kidney injured by large quantities of lithates, but the grosser passages are irritated thereby. Bennett says:—"The epithelial scales which nearly always accompany the lithatic deposits are thrown off by the mucous membrane which lines the urinary passages. When very abundant, their presence may be considered to be the result of irritation of the mucous surface, produced mechanically by the urate of soda and ammonia. Some persons may have turbid urine from the habitual formation of urates, and of other morbid salts, for many years, without irritation of the

urinary mucous membrane taking place. With others it occurs as soon as the lithatic urine is secreted by the kidneys, and is productive of much suffering, of pain in the region of the kidneys, darting along the ureters, and of dull aching sensations over the pubes in the region of the bladder. These symptoms are often accompanied by a constant desire to pass water, which rouses the patient several times in the night, and is not fully relieved by emptying the bladder." Some persons are very susceptible to the presence of urates, and can tell when they reach the bladder by the discomfort experienced.

We may say, then, speaking broadly, that urate deposits are often the immediate result of imperfect assimilation. Lithiasis, or gout proper, as a permanent condition due to mal-assimilation in the liver, has, however, certain relations to the acute production of lithates, as an early outcome of indigestion, which are worth pondering over. It has, too, certain other relations to the production of lithates in pyrexia or organic disease: the whole subject being one of deep interest, but upon which our information is as yet too meagre to enable any generalisations to be positively formulated. It would seem that conditions of acute lithiasis may be implanted upon chronic gouty states; a matter of importance as regards the treatment of the patient.

In gout, pure and simple, the urine is, as a rule, clear; when urate deposits are found, then the digestive organs have got to be looked to as well as the liver.

Then as to the presence of albumen in the urine. It has been said before (p. 19) that there is no connection

between gout and albuminuria, except an incidental one. Albumen may appear in the urine as an indication of renal disease. It may be an outcome of indigestion. The peptones may not be turned back into proteids, and so escape through the tubules of the kidney. The albuminuria of indigestion is now being generally recognized. The most recent utterance on this subject is the article of Dr. Lauder Brunton, F.R.S., in Quain's "Dictionary of Medicine." Here he states in his article on "Albuminuria":—"In order to distinguish more clearly between the different kinds of albuminuria, we may divide them into—1st *true* albuminuria, in which serum-albumin appears in the urine; 2nd *false* albuminuria, in which some other albuminous body, but not serum-albumin, is present. In *true* albuminuria there is always some change either in the circulation through the kidney, or in the structure of the kidney itself. In *false* albuminuria the albuminous body passes out through the kidney, without there being any alteration either in circulation or structure. The chief albuminous bodies occurring in *false* albuminuria are hæmoglobin, egg-albumin, and Bence-Jones's albumin." After speaking of the conditions under which these appear in the urine (which do not concern us here) he says of the last:—"It is almost, if not quite, identical with the hemialbumose which Kühne finds to be one of the products of imperfect digestion. It seems probable that those cases of albuminuria which appear to depend on imperfect digestion, are due to the passage into the systemic circulation of albuminous bodies which have not undergone the

proper transformation in the alimentary canal or liver." Such is the statement of our first authority on this subject. In gouty cases, when the liver is primarily at fault, such "false" albuminuria may be expected to frequently occur.

The gouty kidney is not productive of albuminuria to the same extent as are other forms of renal changes; and this gives a certain probability that in many cases the albuminuria which may show itself in a gouty case should be classed under what Dr. Brunton aptly terms "false albuminuria," rather than be regarded as the evidence of acute renal mischief. Of course when the heart distinctly fails, then we get the albuminuria of venous fulness; about which we have fairly clear conceptions. But when albumen is found in the urine of a gouty subject, where the circulation is good, then it is by no means easy in all cases to decide whether we have "true" or "false" albuminuria to deal with. Certain it is that, in a large number of instances, the albuminuria is the result of derangement in the assimilative processes.

Then comes the question of glycosuria. Recently Sir William Jenner said to me, that he had a number of glycosuric patients under observation who did not seem to be much the worse thereof. Now diabetes is a disease of mal-assimilation. "Stout, well-nourished persons do not die of wasting maladies," was my comment; with which he agreed. Glycosuria is not uncommon with stout persons, who convert more starch into sugar than their system requires. Here the sugar is mere waste. But there are other cases where sugar

in the urine is of the most serious moment, and where the patient quickly sinks. In other cases, again, the disease is slow in its progress; but it is certain in its result. While in other cases the glycosuria is acute as the result of some disturbance of the nervous system, may be of mental origin. Claude Bernard found irritation of the floor of the fourth ventricle to produce diabetes. That glycosuria has relations which entitle it to be regarded as a neurosis, in certain instances, all who have studied the matter will admit. Over-worked business men are common subjects of glycosuria, which often becomes the gravest form of diabetes.* Now the practitioner naturally would like to know how to distinguish the grave from the less serious cases where sugar is found in the urine. Certainly; that is what the writer wishes he could tell him! All that he can say here is problematical, and no more. It would seem that there are corpulent persons who pass sugar constantly without perceptible ill effects. Then there are those who are well-nourished who pass sugar constantly, but who have periods when they present the semeia of diabetes—as we know it—as a disease. These periods often correspond with times of mental worry. Then there are cases where the sugar is passed mainly after a meal; the urine passed on waking in the morning being fairly free from sugar. Then there are those who have diabetes, who are seriously ill; and who, sooner or later, succumb. It would seem that in the corpulent

* "Persons in whom diabetes develops itself from brain-lesions are always thin, as most brain-workers are."—THEODOR CLEMENS.

persons more starch is converted into grape sugar than the liver can dehydrate into glycogen. The surplusage escapes by the kidneys; with what effect upon them is by no means settled as yet. Beyond this last (be it what it may) the glycosuria is without significance. Then, at times, the glycosuria is such as to produce the well-known symptoms. How is this brought about? We do not know. There are circumstances of neurosal relations which do one of two things. (1) Either the power of the liver-cells to dehydrate sugar into glycogen is impaired, and so the sugar escapes, leaving the patient ill-nourished for the want of it; or (2), the ferments of the liver transform the stored glycogen into sugar beyond the needs of the system. The excess is waste. In either case the system is more or less practically hungered; while the excess of sugar in the blood produces its own symptoms. From what has just been said it would appear that glycosuria may be a neurosis,—a temporary disturbance of the glycogenic function of the liver. To diet the patient on food which will give the liver physiological rest, as regards its glycogenic function, is rational. By so doing the liver regains its forfeited power, and the patient recovers in many cases. But the question may be raised—In so giving the liver physiological rest, as regards its glycogenic functions; may not it be over-taxed as regards its other function—the metabolism and elaboration of albuminoids? There are cases of glycosuria in which the treatment, as regards the food, seems to have been more injurious than the original malady. The excess of nitrogenized material

creating lithiasis with all its train of resultant troubles. The reader will do well to think all this over as regards glycosuric patients. If the drain of sugar is neither reducing the patient nor giving rise to diabetic symptoms, is it well in all cases, or even desirable, to push the non-saccharine dietary too far? The glycogenic function of the liver, and its other function of the transformation of albuminoids, cannot be divorced clinically. Then, again, when the liver of an old gouty patient begins to fail in the dehydration of sugar, and the patient wastes with a certain amount of glycosuria; then we know that that patient will die ere long. In such cases it would not be an altogether inaccurate statement to say, "the liver is wearing out." Whether such a phrase is quite admissible or not, perhaps opinions may vary; but it is near enough the fact to be worth bearing in mind.

Now, how far can we do anything for such liver disturbance by drugs? Tonics may help the liver-cells when their capacity to dehydrate the grape sugar of the portal vein is impaired. Rationally, such cases should be those where the sugar is mainly present after meals. Then there are cases which are relieved by opium. In Part I., p. 215, it was pointed out how opium was useful in cases where the patient loses flesh alongside a large production of urea. Then opium did, and does good. Might the hypothesis be raised, that here the liver transformed the albuminoids into urea too readily, and to the detriment of the system. In certain forms of diabetes the case is much benefited by opium or codeia. May the hypothesis be raised that here the liver-ferments

which transform glycogen into grape-sugar are too active. It is in such cases, probably, that agents which lessen activity are useful. Are these the class of cases where opium and codeia are so useful? We do not know; because cases of diabetes have not yet been sufficiently minutely observed for published results to tell us much yet. But it is worth bearing in mind that, if the above suggestions should be verified, the utility of

dietary giving the liver physiological rest in the one class of cases would be manifest, and the utility of drugs be but slight, and of sedatives little or no utility at all; while in the other the dietary is of less moment, and drugs may have a high value. The impression on the writer's mind grows stronger that the grave case of glycosuria is often found with hyper-activity of the liver-cells; and that avoidance of the cerebral excitement which sets up this hyper-activity is just as necessary for the treatment of the case as is opium or codeia, or the brom-arsenic of Clemens. Recently M. Marey brought before the Académie des Sciences of Paris a communication from Dr. Félizet, in which he gave an account of fifteen cases of diabetes mellitus successfully treated by bromide of potassium. The whole subject is one of intense interest. Something more will be said of the relations of worry to glycosuria, as well as other disturbances of assimilation, a little further on (p. 292). It is, however, matter for thought rather than any dogmatic utterances at present.

Then, disturbances of assimilation are found in many gouty cases; but quite as frequently are wanting. They

belong to the class of case where there is gouty dyspepsia and lithiasis due to mal-assimilation rather than gout proper, as ordinarily understood. Where there is a chronic production of uric acid in comparatively small quantities there may be no obvious disturbance of the health; and the individual is perfectly well, except some infiltration of urate of soda into the joints. This is regular gout with articular deformity, and acute paroxysms from time to time. The individual betwixt the attacks being active and well, mentally and bodily; he may be a leading member of Parliament, a master of fox-hounds, the head of a large business or manufactory, or a well-to-do medical man. Here there is the formation of the uric acid of the solid urine of birds and reptiles, to some extent, instead of the urea of mammals. The human kidney is not adapted for the excretion of uric acid, and thus a minute quantity is retained within the system and deposited chiefly in and around joints. Such is chronic regular gout. Now the treatment of such a case seems to be the constant and daily use of some lithic acid solvent to meet the diurnal production of uric acid. (See p. 195.)

• But when the gouty patient complains of dyspeptic symptoms, and the urine is laden with a pale coloured sediment, or deposit of urate of soda, then a totally different state of matters has to be dealt with. Such a condition is not uncommon in gouty cases, either where the patient has always been more or less dyspeptic; or when old gouty cases are beginning to break up; or sometimes it is an acute disturbance. It may be brought

on when the patient will eat unsuitable food in improper quantities. In such a case, in a medical man, he knew how much better he was in all respects when adhering strictly to a milk and farinaceous dietary, which he contemptuously called "pig's victuals," but a keg of oysters or some pork-sausages proved a temptation that was irresistible. Symptoms of indigestion would show themselves in an hour or so, while the urine would be laden with white urate of soda. ("White" probably because so quickly formed as to carry down little or no pigment with it.) In such instances the gout factor in the case becomes quite subordinate to the indigestion factor; and a rigorous dietary as regards quantity and kind of albuminoids, with hepatic stimulants, and perhaps the resort to some artificial digestive agent are indicated.

Indeed, the aspect of the case has to give the indications for treatment. Because the patient is gouty, he, or she, when having intercurrent maladies, has not to be treated merely for gout. Nor is it desirable in such cases of lithiasis from indigestion to flood the patient with uric acid solvents, which will be found very depressant; while the large amount of alkali required would greatly enfeeble gastric digestion. If the reader will ponder over this aspect of lithiasis, he will see that according to the clinical phenomena presented so must be the treatment.

Just as the treatment of gout in the robust differs materially from that suited to atonic gout; or to vary the phraseology "the gouty diathesis" differs from "the gouty cachexia." "The gouty diathesis" is the inherited

constitution with a tendency to gout. It may be and often is that of a robust physique far above the average. A person of "the gouty diathesis" is commonly one of the finest types of manhood; but with a tendency to gouty maladies as years accumulate. "The gouty cachexia" is a cachetic condition with the production of uric acid in excess. Such cachexia may be found in a person of the gouty diathesis, when the constitution has been impaired or broken, as it is termed, with debauchery, or other cause, as over-work in a bad climate. All authorities on gout are agreed that whenever the patient's powers generally become lowered, the case assumes a worse aspect than before. The digestive system is usually much deranged, and there is found flatulence with distension, vitiated stools, sediments in the urine, with an appetite impaired, or depraved; sometimes craving after unsuitable food, with loss of flesh, the muscles being greatly wasted from mal-nutrition. There may be, too, piles or other evidences of fulness of the hemorrhoidal veins. Considerable nervous depression will commonly be found present. Here the indications undoubtedly are to feed up the patient. If a certain amount of uric acid be formed, that must be accepted and dealt with. If the tongue be thickly furred, then some vegetable tonic and an acid before meals, may be given with advantage. A mercurial pill once or twice a week at bedtime, with some sulphate of soda and Rochelle salts next morning, or some purgative water, will do good. The diet must be regulated most strictly; the deteriorated condition of the liver being kept in

mind steadily. Some alkali with the bitter before meals may be indicated, when the tongue has cleaned. Then when the system has once more regained its normal state, or the best that it is capable of, it may be possible to prescribe some iron; but it should be in small quantities, well diluted, and combined with potash or lithia.

The patient, if not residing in a very healthy locality, might be sent to some health resort with advantage. The resort, whether at the seaside, or inland, would be indicated according to the season and the requirements of the case. Indeed, the treatment has to be fitted to the case, like a tailor fits a coat. Some cases present little difficulties; other are "very bad to fit." As to the dietary, it must be liberal of course; but it must be a gouty man's dietary as regards the forms of food. Any indiscretion in diet will produce very perceptible results.

In fact, the great matter to bear in mind in these complications of gout is that it is the liver whose functions are disordered; not forgetting that if the primary digestion be impaired, imperfect products may be formed with which the liver cannot deal satisfactorily. Much indigestion is the resultant outcome of bad teeth. The food, imperfectly masticated, is not properly prepared for the stomach, and dyspepsia is the consequence. So imperfect digestion in the alimentary canal may lead to products which tax the liver; and secondary, or liver indigestion may be due, to a great extent, to imperfect digestion in the alimentary canal. It may, then, be

necessary to improve primary digestion, as well as stimulate the liver, in cases of atonic gout. The food should be suited to the patient's requirements on the one hand, and his capacities on the other. It should be at once nutritious and easily digestible; and contain a fair amount of fat, for healthy histogenesis. In certain cases of atonic gout it may be necessary to send the patient to the seaside, and to give cod-liver oil and iron; just as in other kinds of general atony. Such gout is most common with those of the strumous diathesis; and there are times when the blend of struma gives the direction to the treatment.

Then, again, gout in persons of the nervous diathesis will present features of its own; features very different from those of gout in the gouty diathesis. The latter is regular articular gout in persons often of massive bones, with high vascular activity. The gout of the nervous diathesis will present another aspect, as neuralgia or asthma, with skin affections and commonly dyspepsia. Thus we see that gout will present a different aspect according as it manifests itself in a person of the "gouty," the "nervous," or the "strumous" diathesis.

So, too, gout may be linked with the "bilious diathesis." The patient in early life is "bilious," *i.e.*, he may have vitiated stools, high-coloured urine, more or less headache at times, with general malaise; and may present the dark skin and black hair of the typically bilious subject. There may, too, be spots of pain at the inner angles of the scapulæ. But as time goes on the patient begins to lose the bilious phenomena, and to take on those of

regular gout. Indeed, this is far from uncommon in my experience. There is here a liver which at first splits up the albuminoids freely into bile acids; and during this period we see the clinical phenomena to be those of "biliousness." But in time there ceases to be an excess of bile acids, and uric acid seems to be formed by this peccant liver; and "biliousness" merges into lithiasis, like a dissolving view. Such clinical fact is highly instructive as to the blended functions of that huge gland, the liver; with whose functions we have only in recent years become intimately acquainted.

A question here suggests itself, at what rate do the kidneys become injured, (1) by the excretion of uric acid in chronic gout; and (2) by huge quantities of urates from mal-assimilation? We know that the kidneys do become diseased secondarily to the continued presence of lithates in the blood. We have reason to believe that large capable kidneys may depurate the blood when the liver manifests perversion of function for a long period of time, without evidences of kidney injury being furnished. But beyond this, all that we can say is that there seems an *a priori* probability that when large quantities of urates are cast out, as the result of mal-assimilation in the digestive processes, the kidneys are injured before long. Such lithiasis in connection with regular gout lends a worse aspect to the case. Put in other words it might be said, the prognosis of gout becomes worse in proportion to the amount of mal-digestion present in the case; pure gout, with its characteristic urine, producing less irritation in the kidneys. We

know enough on the subject to wish to know more; and more careful clinical observation will follow greater intimacy with the pathology of conditions of lithiasis.

Garrod has completed our knowledge of the chemistry of gout-poison, and demonstrated the utility of uric acid solvents; we now can take a step forward, and peer into the causes of the formation of uric acid, and have some definite views as to how to affect its formation. But with this advance comes the necessity for closer clinical observation of the different forms of lithiasis, and the rate of progress in each.

Another aspect of the subject of perversion of assimilation, with its myriads of outcomes, is that of how far such troubles are on the increase at the present time? Does the demand upon the nervous system in the present high pressure existence tend to impair the assimilation?

The answer to this must be an affirmative one. In Part I. the subject of the relations of the disorders of nutrition to disturbances of the mental processes was discussed at some length; while the impairment of the digestive organs in the children of persons who lead "high pressure" lives was alluded to. Beyond this, as regards children, lies the question of how far such trouble is directly due to "the children's dinner" being composed of the hotted remains of "the dinner" the night before. Then as to gout.

Sydenham knew well the effects of mental disturbance upon gout. Others have known it since. In this Part (p. 146) two cases are given where mental worry kept up a condition of gouty cachexia, which disappeared when

the mind was put at rest. Clifford Allbutt, who lives amidst much industrial activity with the cares inseparable therefrom, has put down his opinion that mental worry may be a cause of renal degeneration. This is the history of humanity, that a man or woman loses flesh in periods of mental tribulation. There can exist no doubt upon the subject that mental care does impair the processes of assimilation and tissue nutrition. There is no necessity to wait for microscopic demonstration of this fact in a slide marked "Liver cells wasted by care," or another "Commencing atrophy of urinary tubules of the cortex in an emaciated man who committed suicide from commercial trouble."

Such refinements are perhaps possible with the pathologists of a future day. But we, living in the nineteenth century, must be satisfied with something less complete. "Faith is the evidence of things unseen," so we will have to hold to faith till the fulness of knowledge comes. We know the relations of cause and result sufficiently well to understand that over-anxiety, or anxiety which is reasonable enough from the nature of things, but which is more than the organism can bear without injury—and tolerance of worry is a variable factor in different individuals—will interfere with their improvement in a large class of cases; and rest of mind is essential to cure, or even arrest of mischief. Some time ago I was talking with a well-known provincial physician about his own case.

Ten years ago he suddenly threw up a very large consulting practice, and retired from the profession. This

action was due to the discovery that there was sugar in his urine. He was not troubled with symptoms of diabetes; but he did not wait for these. He is still a hale active man. I was much impressed with his remark, "Had I stayed with that huge practice of mine, do you think I would have been alive now?" Certainly and surely he was right! The assimilative processes were beginning to feel the pressure of the load of care and thought; and had the load been carried much longer the disturbances would have progressed, in all human probability. Consequently we will find that in the avoidance of care and anxiety lies a great factor in the prognosis and the treatment of a large class of cases. "Retire from business because I am diabetic! whoever heard of such a thing?" a keen business man may say. Certainly; why not? Do we not hear of new things constantly? Who ten years ago would have believed the telephone a practical success as a means of communication between buildings miles apart?

The siege of Paris furnished a curious contribution to the history of this subject of the effect of mental disturbance upon the nutritive processes. Dr. J. H. Bennett, who is now resident during the winter in France (Mentone), and who knows Paris well, wrote in 1876: "In enumerating the influences that contribute to the development of the various forms of defective nutrition, above described, I must again call attention to the action of the nervous system. Grief, anxiety, mental strain, depression of spirits, in any shape or form, if long continued, lower the general vitality of the

nervous system, and of all the functions of the economy which it controls and governs. Not only is the digestive or chylipoietic system impaired generally, but the more intimate or capillary functions of nutrition may be modified, and thus any form of morbid nutritive action, of chronic disease may supervene, from dyspepsia to cancer. It is in this manner, no doubt, that grief and anxiety kill, by bringing on some fatal form of disease, the result of impaired, defective nutrition, when "dull care sits at the board," and poisons the food. We ought all to strive to bear sorrow and mental suffering with resignation and calmness, if we wish to escape death from some form of chronic disease. The above facts were markedly and painfully illustrated in the Siege of Paris in 1870. Not only were the defenders of that city badly fed and half poisoned with alcoholic beverages, but they were also in a low state of organic vitality, in a condition of extreme mental depression. The result was, they died like flies in autumn. The slightest wound proved fatal, from pyæmia or gangrene: whilst the slightest general ailment, such as bronchitis or diarrhoea, terminated rapidly in death." Dr. Bennett's opinion is no doubtful one. We often read, in works of the past, of persons, especially young females, who "wasted away" after some misfortune. Dr. C. J. B. Williams records it as his opinion that when persons die "broken hearted," pulmonary consumption is commonly the physical cause of death. Wasting disease is the outcome of mental distress to a very large extent.

Scudamore, who certainly lived before the day when the wheel of the steam engine made all the world move faster than ever before, had formed opinions which are worth our notice. He said : " In considering the question of the particular viscus which has been the primary seat of complaint, when a complicated case of disorder affecting the digestive organs and the nervous system comes before us, I am induced to believe that sometimes we too much overlook the influence of the brain, and may fail in our treatment from confining our attention to the remote effects of disease. With whatever intensity the brain may be acting as an instrument of the mind, its physical functions (if I may be allowed the distinction) may be so disordered as to become the important source of serious secondary complaint. It is an organ, not only subject to physical causes of injury and disturbance, in common with the other viscera; but is, also, under the peculiar immediate influence of all our passions and emotions.

"It is highly probable, therefore, as a matter of theory, that the state of the circulation of the brain and the conditions of its nervous powers, should be frequently thrown into disorder, and have a powerful primary influence on the healthy actions of the digestive organs. So far as the direct application of physical remedies to this organ is in our power, our chief assistance consists in those means of treatment which either increase or lessen the quantity of its blood, or which tend to make its circulation equal and regular. Much, indeed, is to be accomplished through the medium of the mind; and in

this species of advice the physician must at once become the philosopher and the philanthropist."

On the other hand, Abercrombie points out how the symptoms referable to the stomach in organic disease of the brain, in its early stages, may lead to error in diagnosis; which the later progress of the case clears up.

The relation of the brain as the organ of mind to the viscera engaged in the work of assimilation, and the conversion of certain principles of our food into the aliment of the body, are not of such modern origin as to constitute them a mere fashionable phase of thought of the day. Recent observations as to the nature of the constituent portions of the cerebro-spinal system, have drawn the attention of the profession to the importance of the nervous system and its maladies. But the part least illumined yet of all the cerebral hemispheres is the posterior cerebral lobes, which are in connection with our subjective sensations. The viscera may be represented there, just as the muscles have their area in "the motor band," as Hughlings Jackson speculates. The sense of well-being which exists when these lobes are well fed with blood, contrasts with the sense of wretchedness which prevails when they are ill supplied with blood. The converse of this, the evil effects upon the assimilative processes which result from carking care, contrast with the well-fed system of the person who is free from such anxiety. In Part I. the question has been taken up of how far the malproducts of perverted assimilation act as poisons to the brain; so here it is opportune to discuss the effects of excessive mental toil, or worry in the production

of perversions of nutrition. The liver seems specifically under the influence of the emotions; consequently the maladies which take their origin in the liver, as biliousness, lithiasis, diabetes, and albuminuria (some forms) are intimately related to the brain and its functions. Perhaps the more confirmed conditions may once have been to a large extent mere "neuroses;" and thus been at a distinctly curable stage, had their precise relations been thoroughly comprehended. Put in other words, we are at least in a position to speculate that these maladies may in many instances take their origin in mental states capable of modification; and that good effects therefrom are felt upon the remoter outcomes of mental states. Mental perturbation may possibly be found to be an exciting factor in the production of free quantities of lithates from mal-assimilation in the subjects of chronic gout. The time comes when the progress of the gout compels retirement from profession or business; "things go wrong," and the worn system feels the disturbance; a new condition of lithiasis is grafted on old chronic gout, and the patient goes from bad to worse, with considerable rapidity. Cases of this kind have come under my notice. But the matter cannot be regarded as more than *sub judice* as yet.

Finally, are there grounds for supposing that gout is on the increase at the present time? The subject has been spoken of before, but some further remarks may not be quite out of place. Budd thought (p. 162), that the change of their habits had led to less gout in certain classes than had been the case in anterior years.

Granting this, it must be admitted that there is, on the whole, a much greater amount of gout amongst us than there used to be. The classes which have gout are constantly being recruited by new additions as our wealth increases. Since the days of commercial intercourse with the South of France, under our Angevin kings, and the growth of wool-production for our trade with Flanders; and still more since our colonies have added to our mercantile enterprise, the accumulation of wealth has added to the ranks of the affluent. Old families have not disappeared, because family estates and titles have passed by the marriage of heiresses to the children of men of briefer descent, comparative upstarts; by which infusions of new blood—blood free from the taint of uric acid—have been brought into veins in which “blue blood” coursed. Such marriages have kept many a race alive by the “spindle-side.” These races survive and have gout; while constant drafts are being made to the ranks of the gouty from new comers, those who are becoming affluent. The steam engine has brought much wealth, much good living, eating and drinking; and in their wake much gout in more or less regular, or irregular forms. The liver of one man, sorely exercised by the practices of its owner, becomes the hereditary possession of his offspring. The “insufficient liver” of Murchison is an inheritance which often passes down with wealth. “Gout is the cure of gout;” and abstemiousness in one generation may restore a fairly active liver to the progeny of the man who could practice self-denial. But the insufficient liver is often linked with kidneys not remarkable for functional

activity; and then the systemic evidences of a blood charged with urates are furnished in some form or other. The ways of the Regency and the indulgence in port wine, now mainly seen in the manufacturers along the slopes of the back-bone of England, were not without their influence. "The grandfather lived well, and died old, without ever having had a touch of gout, unless it was in the muscular pains which he called 'rheumatics.' The father lived well, probably knew nothing of doctors; swore at his rheumatism occasionally; had winter bronchitis; and died of aortic disease. The present representative of the family has attacks of articular gout, a great toe which occupies a good deal of his attention, and thickened knuckles—indeed, full blown gout." ("The Gouty Heart.")

There is, indeed, a gradual evolution of gout from the luxurious living now common in a large section of society. The Scotch and the people of the United States may have been free from gout, "because they have not been rich long enough," as my Scotch friend observed; but gout is not unknown either in the great intellectual centre, Edinburgh, or the huge commercial centre, Glasgow; while Fordyce Barker is inclined to think gout is far from uncommon in the United States of America; and as the eye learns to distinguish gout so it sees more of it; that it is indeed an illustration of the axiom common with the old Italian painters, "The eye can only see what it carries with it the power to see." Yet the older observers had got as true an eye as any of us now possess; and there is reason to hold that gout, like other disturbances

of the liver, is actually on the increase at the present day.

The mental tension of modern times in the pursuit of riches is telling upon the processes of nutrition ; while affluence undoubtedly tends to gout. Indeed, it may be said with truth,—gout lies couched in the shadow of wealth.

Consequently Milton's admirable rule should be obeyed now more than ever :—

“The rule of ‘not too much’ by temperance taught,
In what thou eat’st and drink’st ; seeking from thence,
Due nourishment, not gluttonous delight.”

FINIS.

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